

# NAVAL POSTGRADUATE SCHOOL

## Monterey, California



# THESIS

**INCREASING NPS ENROLLMENT: A COST-BENEFIT ANALYSIS OF  
IMPLEMENTING DISTRIBUTED LEARNING AND THE MASTERS  
OF BUSINESS ADMINISTRATION PROGRAMS**

by

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December 2001

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## REPORT DOCUMENTATION PAGE

Form Approved OMB No.  
0704-0188

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1. REPORT DATE (DD-MM-YYYY) 01-12-2001	2. REPORT TYPE Master's Thesis	3. DATES COVERED (FROM - TO) xx-xx-2001 to xx-xx-2001		
4. TITLE AND SUBTITLE Increasing NPS Enrollment: A Cost-Benefit Analysis of Implementing Distributed Learning and the Masters of Business Administration Programs Unclassified		5a. CONTRACT NUMBER 5b. GRANT NUMBER 5c. PROGRAM ELEMENT NUMBER		
6. AUTHOR(S) DesJardins, Kenneth T. ; Kohmuench, William S. ;		5d. PROJECT NUMBER 5e. TASK NUMBER 5f. WORK UNIT NUMBER		
7. PERFORMING ORGANIZATION NAME AND ADDRESS Naval Postgraduate School Monterey, CA93943-5000		8. PERFORMING ORGANIZATION REPORT NUMBER		
9. SPONSORING/MONITORING AGENCY NAME AND ADDRESS ,		10. SPONSOR/MONITOR'S ACRONYM(S) 11. SPONSOR/MONITOR'S REPORT NUMBER(S)		
12. DISTRIBUTION/AVAILABILITY STATEMENT APUBLIC RELEASE ,				
13. SUPPLEMENTARY NOTES				
14. ABSTRACT This thesis examines the effects of the Distributed Learning (DL) and Masters of Business Administration (MBA) programs on NPS enrollment. In recent years, enrollment at the Naval Postgraduate School (NPS) has significantly declined. To reverse this trend, NPS is considering shortening a student's required time-on-station to earn a master's degree. Shortening the time an officer spends at NPS may increase enrollment, as a quick return to the fleet is likely to attract support from both Navy leadership and prospective students. Our thesis research evaluated the current strategies to increase NPS enrollment: Distributed Learning (DL), and the Masters of Business Administration (MBA) programs. Our objective was to provide NPS leadership with a viable course of action that increases student enrollment while providing a quality education. We conducted a detailed cost/benefit analysis of current time-on-station reduction strategies. Our research included a student survey, stakeholder interviews, a thorough application of Little's Law, and a collection of relevant enrollment, promotion, and graduate education data. We concluded that the DL and MBA programs will reduce NPS resident enrollment and may reduce the quality of resident student. However, the DL program significantly benefits all stakeholders, but one. Currently, the Navy provides no incentives for prospective students to embrace DL.				
15. SUBJECT TERMS Distributed Learning; Distance Learning; Masters of Business Administration; Enrollment; Naval Postgraduate School; Graduate Education				
16. SECURITY CLASSIFICATION OF:  a. REPORT Unclassified		17. LIMITATION OF ABSTRACT Public Release	18. NUMBER OF PAGES 110	19. NAME OF RESPONSIBLE PERSON Fenster, Lynn lfenster@dtic.mil
b. ABSTRACT Unclassified		19b. TELEPHONE NUMBER International Area Code Area Code Telephone Number 703767-9007 DSN 427-9007		
Standard Form 298 (Rev. 8-98) Prescribed by ANSI Std Z39.18				

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**REPORT DOCUMENTATION PAGE***Form Approved OMB No. 0704-0188*

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<b>1. AGENCY USE ONLY (Leave blank)</b>	<b>2. REPORT DATE</b> December 2001	<b>3. REPORT TYPE AND DATES COVERED</b> Master's Thesis
<b>4. TITLE AND SUBTITLE:</b> Increasing NPS Enrollment: A Cost-Benefit Analysis of Implementing Distributed Learning and the Masters of Business Administration Programs		<b>5. FUNDING NUMBERS</b>
<b>6. AUTHOR(S)</b> DesJardins, Kenneth T. and Kohmuench, William S.		
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> Naval Postgraduate School Monterey, CA 93943-5000		<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>
<b>9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> N/A		<b>10. SPONSORING/MONITORING AGENCY REPORT NUMBER</b>
<b>11. SUPPLEMENTARY NOTES</b> The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.		
<b>12a. DISTRIBUTION / AVAILABILITY STATEMENT</b> Approved for public release; distribution is unlimited.	<b>12b. DISTRIBUTION CODE</b>	

**13. ABSTRACT (maximum 200 words)**

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<b>14. SUBJECT TERMS</b> Distributed Learning, Distance Learning, Masters of Business Administration, Enrollment, Naval Postgraduate School, Graduate Education		<b>15. NUMBER OF PAGES</b> 110
<b>16. PRICE CODE</b>		
<b>17. SECURITY CLASSIFICATION OF REPORT</b> Unclassified	<b>18. SECURITY CLASSIFICATION OF THIS PAGE</b> Unclassified	<b>19. SECURITY CLASSIFICATION OF ABSTRACT</b> Unclassified
		<b>20. LIMITATION OF ABSTRACT</b> UL

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)  
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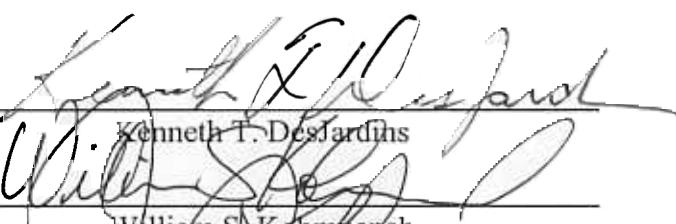
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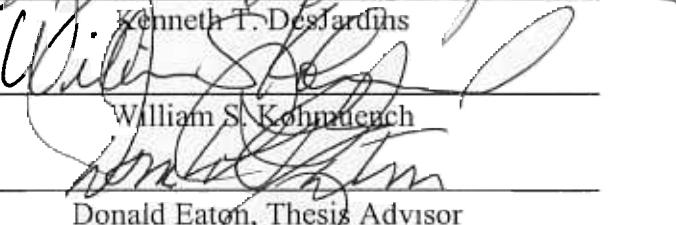
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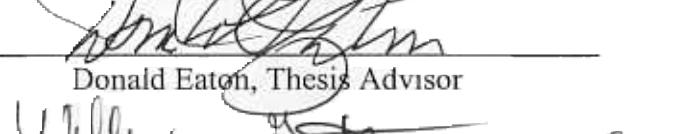
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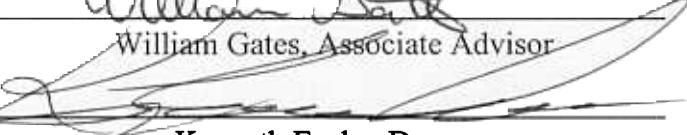
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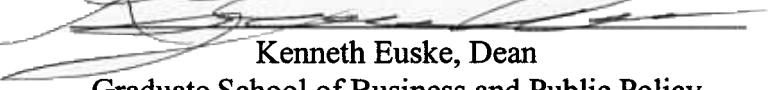
  
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## ABSTRACT

This thesis examines the effects of the Distributed Learning (DL) and Masters of Business Administration (MBA) programs on NPS enrollment. In recent years, enrollment at the Naval Postgraduate School (NPS) has significantly declined. To reverse this trend, NPS is considering shortening a student's required time-on-station to earn a master's degree. Shortening the time an officer spends at NPS may increase enrollment, as a quick return to the fleet is likely to attract support from both Navy leadership and prospective students. Our thesis research evaluated the current strategies to increase NPS enrollment: Distributed Learning (DL), and the Masters of Business Administration (MBA) programs. Our objective was to provide NPS leadership with a viable course of action that increases student enrollment while providing a quality education. We conducted a detailed cost/benefit analysis of current time-on-station reduction strategies. Our research included a student survey, stakeholder interviews, a thorough application of Little's Law, and a collection of relevant enrollment, promotion, and graduate education data. We concluded that the DL and MBA programs will reduce NPS resident enrollment and may reduce the quality of resident student. However, the DL program significantly benefits all stakeholders, but one. Currently, the Navy provides no incentives for prospective students to embrace DL.

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## **ACKNOWLEDGMENT**

We would like to thank our wives, Tammy and Sheri, for their unwavering support and devotion during our time at the Naval Postgraduate School. Furthermore, we appreciate Admiral Eaton's and Professor Gates' patience, encouragement, and mentoring. Finally, we would like to thank the Lord Jesus Christ for without him none of this would have been possible.

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## I. INTRODUCTION

### A. ENVIRONMENT

Since 1992 enrollment at Navy Postgraduate School (NPS) has declined significantly. Specifically, Unrestricted Line Officer (URL) enrollment, particularly that of pilots and Surface Warfare Officers (SWOs), has declined by over 60 percent. An overall decrease in the total number of officers in the Navy is likely the most significant driver behind reduced enrollment at NPS. In fact, the Navy's officer population decreased by 16,679 personnel or 23.7 percent during the period from 1992 to 2000. During the same period, the Navy's URL community shrank by 6,703 or 24.7 percent. As the available base of prospective students steeply declines, we should expect enrollments to decline accordingly. Navy end-strength data from Defense Manpower Data Center (DMPC) is summarized in table 1.

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
All Officers	70,262	65,373	60,441	58,019	57,154	55,648	N/A	N/A	53,853
URL Only	27,136	26,710	23,844	20,809	20,117	19,881	19,369	19,119	20,433

Table 1. Naval Officer End Strength

Unrestricted Line Officers pay a high price, in career terms, to attend NPS. A major impediment to enrollment at NPS is the long resident time that it takes to earn a masters degree. Many prospective students do not consider NPS a viable option for graduate education because of the many months spent out of an officer's career path. NPS takes pilots out of the cockpit, SWOs out of the pilothouse, and other students away from the fleet. Some feel this time away from the fleet dulls perishable fleet skills and hampers chances for promotion. URL communities are most affected by unobserved time spent in Monterey. The perception is that URLs cannot afford to come to NPS.

Additional costs, measured primarily in officer salaries, of spending 18 to 27 months at NPS are another driver of reduced enrollment at NPS. An NPS education may

be too expensive. Graham (2000) has stated that the cost to send an officer is too high and NPS is no longer competitive with civilian post-graduate schools.

To reverse the declining trend in enrollment and remain competitive within the current environment, NPS is exploring alternatives to reducing the amount of time an officer is in residence at NPS in order to attract more students. Leadership has suggested that NPS could significantly increase enrollment if officer on station time is reduced.

## **B. BACKGROUND**

Enrollment at NPS has declined from 1,880 officers in 1992 to approximately 1,300 in 2000. The decline in enrollment has led to a smaller base to apply the fixed costs of NPS and leads to higher cost per student.

If NPS could reduce the required time on campus to earn a degree, it could reduce the cost of an NPS degree. Current average officer on station time at NPS is 22.8 months with a future goal of 18 months (Eoyang, 2001). A Center for Naval Analysis (CNA) bottom-up review states that the most significant cost of an officer education at NPS is attributed to officer time on campus. In fact, the CNA study states the one-quarter of an officer's time at NPS is spent on refresher course work or transitional core courses. These courses are required because many students arrive at NPS unprepared to commence graduate level studies in their assigned majors. Most officers arriving at NPS completed their undergraduate studies six to eight years prior to reporting to NPS. Moreover, students, who are transferring across disciplines may not have an adequate or appropriate technical background and are required to complete undergraduate courses at NPS prior to officially starting their post-graduate studies. NPS provides these refresher and transitional core courses as part of the post-graduate curriculum. (Cavalluzzo & Cymrot, 1998)

A combination of Web-Based Instruction (WBI) and Videoteleeducation (VTE) may allow students to complete refresher and core courses prior to arriving at NPS for resident study, which should also reduce officer time on station at NPS. Some decision makers believe a shorter curriculum through Distance Learning (DL) could reduce officer time on station, reduce educational costs, increase enrollment, and allow NPS to remain competitive with civilian institutions.

At the same time, the Graduate School of Business and Public Policy (GSBPP) is replacing the 18-month to 21-month Master of Science (MS) program with a potentially

shorter MBA program. Offering an MBA program will allow NPS to respond to current trends in graduate education and may attract more students from the fleet. Prospective students may value an MBA more than they may value an MS. In fact, if an MBA is more attractive to prospective students, URL's may take a temporary absence from the fleet and operating forces despite the adverse impact, which an absence may have upon their careers.

### **C. PURPOSE**

And it will fall out as in a complication of diseases, that by applying a remedy to one sore, you will provoke another; and that which removes the one ill symptom produces others...

- Sir Thomas More (Sternman, 2000)

As both officers and students, we recommend that before NPS implements a policy to shorten the curriculum in order to increase enrollment, NPS should consider the full implications of such action. We believe that reducing costs in terms of officer salary or time on station may not lead to an increase of NPS enrollment.

The objective of our thesis is to determine the impact that shortening time on station has on curriculum sponsors, students, NPS, the Navy and the Marine Corps. We will attempt to show that decreasing officer time on station may not increase enrollment. We will also provide NPS leadership with a viable course of action that increases student enrollment while providing a quality education.

Our research will include a detailed cost/benefit analysis of current time on station (TOS) reduction strategies. Specifically, we will examine Distance Learning (DL), in the form of VTE, WBI, and the Masters of Business Administration (MBA) programs.

Currently, some decision makers support a reduction in officer time on station because curriculum sponsors and senior leaders in the Navy's Unrestricted Line (URL) communities have indicated that if officers could get a masters degree in 12-months, they would significantly increase the number of officers sent to NPS. The Navy RL communities and the other services have also indicated that decreasing the NPS onboard time to 12-months would make NPS extremely attractive for graduate education.

We strongly feel that NPS must make an accurate assessment of URL community leaders' preferences for more officers with graduate education experience or for saving

salaries/hours away from the fleet. NPS must know this prior to going forward with any aggressive reduction of program time.

In the current environment, both dollars and manpower are extremely scarce. Community leaders could rationally choose to take the savings in manpower and dollars and maintain the status quo in officer education. Recently, the Surface Warfare Officer (SWO) community began paying large bonuses to retain the officers they have now. It is quite probable that the SWO community may use the savings in time on station to increase shipboard manning rather than sending more officers to NPS. Curriculum sponsors and communities leaders will readily embrace a reduction in program time. A reduction in officer time on station at NPS will cost sponsors very little. In fact, DL/WBI would save sponsors many dollars at the expense of already overworked ship-based junior officers. Reduced time on station may have the opposite effect and lead to a reduction in enrollment at NPS.

Although sponsors and the Navy leadership may support a shortened time on station requirement, prospective students may not. The costs of completing refresher and/or core/basic courses on their own time prior to reporting to NPS may discourage or unintentionally disqualify officers from applying for NPS's graduate programs. Junior officers, already working in shrinking, understaffed officer corps, may not have the time to complete economics and accounting courses after 12 to 14 hour workdays. Therefore, some strategies to reduce time on station might actually decrease enrollment.

#### **D. SCOPE**

The scope of this thesis will include an evaluation of the costs and benefits associated with the DL programs and their impact upon enrollment at NPS. Because of the technical nature of most 24-month programs and the fact that nearly 40 percent of NPS's programs are 18 months long, we will limit our study to 18-month programs. These programs are primarily offered by the GSBPP. The thesis will conclude with recommendations for increasing enrollment of both Navy and Marine Corps personnel at NPS.

## **E. METHODOLOGY**

This thesis will mainly discuss the impact upon enrollment resulting from a reduction of officer time on station.

We will draw upon information from a literature search of books, magazine articles, CD-ROM systems and other library information resources. Additionally, we will conduct phone and personal interviews with members at NPS, Defense Manpower Data Center (DMPC), Bureau of Naval Personnel, and Headquarters, Marine Corps (HQMC).

We will provide a summary review of the DL and MBA programs. We will thoroughly review and analyze officer manpower data obtained from DMPC, Navy Bureau of Personnel, HQMC and NPS administrative personnel. We will conduct a survey of officers currently attending NPS programs, which are less than or equal to 18-months duration.

We will use Little's Law to conduct an examination of the impact of reducing officer time on station. Little Law's states that  $\text{Inventory} = \text{Throughput} * \text{Cycle-Time}$  (Little, 1964). As NPS reduces the required time on station to earn a degree, NPS reduces cycle time. We will examine what impact this has on student enrollment (inventory) and throughput (degrees awarded).

Finally, we will conduct a cost/benefit analysis of reducing time on station at NPS.

## **F. ORGANIZATION**

We have provided the reader with the current environment, background, purpose, scope, and methodology of our thesis. Our study is organized into the format provided below:

- I. Introduction
- II. Literature Review
- III. Methodology
- IV. Data Obtained
- V. Cost and Benefit Data Analysis
- VI. Summary, Conclusions, and Recommendations

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## II. LITERATURE REVIEW

### A. OVERVIEW

During our research, we reviewed theses, professional journal articles, mission statements, websites, several government reports, reviews and in-depth analyses. Initially, we expected that our research would follow in the footsteps of other theses. We were wrong. Not much analysis has been published concerning our research question. However, many published works discussed some aspect of NPS or problem solving that we felt were significant in our examination of the costs and benefits of NPS' DL and MBA programs. We discuss the significant related works below.

#### 1. Business Dynamics – Systems Thinking and Modeling for a Complex World

In his textbook, John D. Sterman suggests that we think of the world as a complex system. His first chapter discusses the skills required to develop systems thinking capabilities and how to use system dynamics in organizations to address important problems. Sterman writes, "... it has long been acknowledged that people seeking to solve a problem often make it worse. Our policies may create unanticipated side effects. Our attempts to stabilize the system may destabilize it. Our decisions may provoke reactions by others seeking to restore the balance we upset." (Sterman, 2000) The provoked reactions by those seeking to restore the balance are policy resistance. This phenomenon is called the "counterintuitive behavior of social systems."

One objective in this thesis is to examine possible side effects from mandating the completion of distance learning courses as a prerequisite to resident study. We will discuss and point out some possible negative outcomes of a policy to mandate DL. Sterman quotes essayist Lewis Thomas. "... You cannot meddle with one part of a complex system from the outside without the almost certain risk of setting off disastrous events that you hadn't counted on in other, remote parts. If you want to fix something, you are first obliged to understand... the whole system... Intervening is a way of causing trouble." We seek to understand this complex system in order to anticipate possible "disastrous events," which may not be anticipated.

Sternman illustrates example after example of political decisions that have had counterintuitive results. Among the litany of examples, he discusses U.S. flood control efforts, the U.S. policy of fire suppression, managed-care systems, and the deregulation of the U.S. Savings and Loan industry. These policy decisions were failures because leaders failed to consider the entire complex system. Levee and dam construction, which prevents the natural run-off of excess water, has led to more severe floods. The size, severity, and danger of forest fires have increased and consumed the oldest and largest trees, which previously survived smaller burns. Limiting the medications that HMOs can prescribe has the unintended effect of increasing of medication. Finally, the deregulation of the Savings and Loan industry, designed to save the industry from financial problems, led to a wave of speculation followed by collapse that cost taxpayers hundreds of billions of dollars. (Sternman, 2000) What counterintuitive results are lurking in NPS's future?

Sternman states we must understand the full range of feedbacks operating in the system. Feedbacks from system changing decisions are effects. Those effects that we thought of beforehand are considered intended. Unintended effects, or feedback which undercut policy decisions, are what we call side effects. Sternman believes that side effects don't exist. All feedbacks are effects. When we have those unintended effects, it shows that we simply didn't understand the system. In this thesis, we seek to understand the complex system of NPS enrollment in order to assist policymakers in shaping the future at NPS.

## **2. Costs and Benefits of Network Based Instruction at NPS**

In June 1998, NPS student Brian K. Sorenson completed a cost-benefit analysis on Network Based Instruction (NBI). Sorenson's thesis found NBI a "viable option for learning at NPS." The costs portion of Sorenson's thesis mostly covered the costs of establishing and administering an NBI course. His chapter on benefits stated that NBI would make educational opportunities available to more officers. However, in his costs analysis Sorenson does not look at the costs from the perspective of officers who are major stakeholders in DL and at NPS. Furthermore, he cites the reduction in officer residency time at NPS as one of the most significant benefits of NBI. Reduced residency would allow the Navy to use the officer elsewhere, such as out in the fleet.

However, in his conclusion Sorenson cautioned that there were several other issues, which NPS must explore in detail prior to fully committing to NBI. Like any

good business organization, NPS must determine the potential market for its new product (e.g. distance learning) before going into that business. Some questions that need to be answered are: If DL is offered, will officers take advantage of the program? What is the size of the customer base and who will be the customers? Finally, what incentives could NPS or the Navy provide to induce both officers and instructors to embrace DL? (Sorenson, 1998)

### **3. Tangled Webs in Public Administration: Organizational Issues in Distance Learning**

Dianne Rahm of Iowa State University and B.J. Reed of the University of Nebraska at Omaha wrote an article concerning organizational issues in distance learning. In the article, they discuss reasons that graduate institutions adopt distance-learning technologies. Rahm and Reed also consider NPS in an organizational case study.

Rahm and Reed surveyed 157 and 180 graduate schools in two different surveys. Their findings concerning distance learning adoption factors follow:

Adopters of distance learning technologies are driven to do so largely by external stakeholders... Directors tend to think that the main factors driving the move toward distance education within higher education include cost effectiveness needs (with 80 percent of respondents indicating this factor is important or very important), the desire for increased enrollment (88 percent), revenue enhancement (83 percent), and the need to deliver courses via distance learning technologies so as to remain competitive (90 percent). (Rahm, 1998)

Through their survey, Rahm and Reed concluded that external actors largely push distance education efforts at NPS rather than being driven by NPS's faculty. The school's administrators are much more enthusiastic about distance learning initiatives than the NPS faculty.

### **4. Rethinking the Naval Postgraduate School**

Janice Graham, a retired Navy officer, 1991 NPS graduate, and current associate at The Potomac Institute for Policy Studies in Rosslyn, Virginia, wrote an article, "Rethinking the Navy Postgraduate School," published in *Proceedings*, which states that NPS is no longer unique and its functions should be privatized. She cites low utilization rates of naval officer graduates in subspecialty skills as the primary reason why an NPS

education is no longer unique or relevant. Graham suggests education vouchers, privatization, and outsourcing as alternatives to an NPS education. Furthermore, she states that the Navy's culture is not conducive to, nor does it reward, an officer who pursues a postgraduate education at the expense of an operational tour.

## **5. It's About Value**

In their August 2000 Proceedings article, retired Admiral Henry H. Mauz Jr. and NPS Associate Professor Dr. Bill Gates, refute Graham's claim that NPS is no longer unique and relevant. The authors state that Graham is "driven largely by her interpretation of the Department of the Navy's values and objectives for graduate education and a superficial analysis of relative graduation costs." (Mauz, 2000) The authors further state that Graham's recommendations for privatization and outsourcing "reflect the notion that one graduate degree will serve the department just about as well as any other." (Mauz, 2000) The authors disagree with such a notion.

Admiral Mauz and Professor Gates list many critical characteristics that distinguish NPS from civilian universities. Several of these characteristics are important when we discuss the costs and benefits of distributed learning:

Entrance to NPS is controlled by military performance and demonstrated aptitude rather than undergraduate grade point average and standardized testing.

NPS provides able and motivated officers the opportunity to transition from one undergraduate area to a different graduate major.

NPS provides refresher courses to allow students to renew academic skills after several years of on-the-job performance. (Mauz, 2000)

We will revisit these characteristics in Chapter V.

Admiral Mauz and Professor Gates state that to perform a cost comparison of an NPS education and an education provided by civilian institution is difficult, at best. Some of these difficulties arise in discerning how to translate endowments and state and local taxes that subsidize civilian institutions. However, the authors do list important attributes of NPS that increase NPS's average education cost per student. A DL program at NPS may affect these costs. We will analyze these costs in Chapter 5. A few of these costs include:

Academic scheduling with heavy class loads.

Required theses in all degree programs.

Dedication to graduate education – instruction by regular faculty; no teaching assistants.

Student salaries and benefits – The department of the Navy's Director, Assessment Division, estimated that the annual cost of salary, benefits, and housing per NPS-resident officer totaled \$63,300. (Mauz, 2000)

Mauz and Gates illustrate that when data from NPS is normalized against cost data from civilian institutions, NPS comes out on top. NPS provides the Navy with a significant return on investment.

## **6. CNA Study: A Bottom-up Assessment of Navy Flagship Schools**

In 1998, the Center for Naval Analysis performed a study of the Navy's Flagship Schools. For this study, N81 directed the CNA to evaluate the current quality and condition of these schools. The CNA put NPS under a microscope and provided the Navy with feedback concerning graduate utilization in subspecialty billets and time graduates spend on station at NPS.

In a stinging summary, the CNA criticized the Navy's utilization of graduates:

We find that the flagship schools offer excellent graduate and professional military education, but that the Navy does not use its graduates in a manner consistent with these programs of study. It appears that the most important thing top Navy leaders can do for graduate and professional military education is to rethink their purpose and restructure their programs to better match the challenges faced by officer graduates. (CNA 1998)

The CNA found that the Navy does not take full advantage of its graduates. Few NPS graduates fill subspecialty billets for which they were educated. Moreover, many graduates who do fill subspecialty billets do so after a substantial lag between their education and their payback tour.

The CNA suggested that perhaps a more general education would be sufficient in educating the officer corps in place of the current curricula. The CNA further stated that:

- The present Navy process for determining curricular content and program length adds costs to education without recognition of those costs by curriculum sponsors. Revising the requirements process could improve cost-effectiveness.
- The Navy could *reduce the level of detail in defining subspecialty requirements* to enable NPS to streamline curricula and gain efficiencies through merger of small programs that are expensive to maintain.
- In addition, more general requirements will allow greater consideration of civilian alternatives. Introducing competition will provide incentives for NPS to seek efficiencies and reduce costs, or risk losing their students. (CNA, 1998)

With civilian schools offering similar graduate content and the low utilization of graduates in subspecialty billets, the CNA felt that the “Navy has not made enough of the NPS charter to offer studies that meet the unique needs of the military community.”

The CNA also made comments about the time it takes students to earn their graduate degrees at NPS. Recognized as a significant part of the high cost of graduate education, the CNA was critical of the NPS student’s required time on station. The CNA noted that nearly one forth of the time spent at NPS was in undergraduate transition or refresher coursework. The CNA provided suggestions for NPS to reduce time spent as a resident student. The suggestions follow:

- NPS could offer refresher courses at a distance by taking advantage of CD-ROM or other technologies.
- NPS should also consider the use of provisional acceptances. Officers who are making transitions across disciplines could be required to successfully complete some of the necessary undergraduate coursework before enrolling in a residential graduate program.
- The Department of the Navy could exploit training delays frequently faced by USNA graduates by sending some of them directly to NPS for graduate studies. This would reduce time on campus, cut the cost of student salaries, and help to smooth the flow of new officers to their first assignments for training. On the other hand, such a strategy could reduce the retention rates of officers who are furnished with postgraduate education so early in their careers. (CNA, 1998)

Finally, the CNA noted that NPS has lost enrollment as a result of military downsizing and budget cuts and is not operating at capacity.

## **7. The NPS Faculty's Critique of CNA's a Bottom-UP Assessment of Navy Flagship Schools**

Professor William R. Gates et al. published a NPS response to the CNA study. In their response, the faculty pointed out “crucial flaws that bias” the CNA’s study against NPS. For our study, the significant bias is that the CNA examines an incomplete measure of costs. The CNA does not consider officer salaries and housing costs. As the primary drivers of the overall cost of an NPS education, officer salaries and housing costs, when considered at other graduate institutions, make NPS a cost effective method to educate officers. It is important to note that program duration drives overall costs, as well. If an officer is at NPS for less time, he is paid less while he’s here and he pays less rent. In fact, Gates et al. conclude, “Since the overall costs of graduate education are dominated by officers’ salaries and housing costs, our analysis shows that the total costs are about the same, regardless of the provider. Hence, any policy decisions made on graduate education should be made on the basis of benefits to the Navy, in addition to costs.”

Gates, et al. also extol those benefits that NPS offers to the Navy and the development of the officer corps:

- Military and technical relevance of courses, theses, and curriculum content
- Specialized educational laboratory facilities devoted to military hardware and computer systems
- Officers and faculty with military expertise who produce analysis and research products that benefit the Navy and DOD
- An admissions system with primary emphasis on military performance and secondary emphasis on academic performance
- Refresher and transition mechanisms that efficiently and effectively meet the need to allow for a time delay between undergraduate and graduate studies and for the assignment of officers to curricula that meet current Navy personnel requirements.

- An instructional tempo that operates year-round and allows higher-than-average course loads
- Military infrastructure that allows the officers to remain in a professional environment while at school, including opportunities for interaction with officers from other services and countries. (Gates, et al. 1998)

In response to the CNA's criticism of the subspecialty utilization rate, Gates, et al. point out that the CNA's solution of consolidating subspecialties and curricula was not based on any cost-benefit analysis. Furthermore, Gates, et al. state, "without a complete assessment of the value of graduate education, those communities with nominally low [subspecialty] utilization *are* benefiting from the analytical reasoning skills, military-technical familiarization, and other products of NPS graduate education." In fact, "the [subspecialty] utilization rate does not measure these benefits and was never expected to do so." The CNA failed to weigh any benefits against the low utilization rate of NPS' graduates.

## 8. A View to the Future

The Naval Postgraduate School Public Affairs office published a paper on their web page titled, "A View to the Future." *A View to the Future* contains much of the same content as the article that follows in the next sub-section. Written by Admiral Ellison, this paper discusses the future of NPS and how NPS will become the cornerstone of military-relevant graduate-level education for our Naval services, other U.S. military services, and our allies." The paper "provides a brief overview of NPS plans to provide the nation with a substantial return for its investment in the NPS." These plans include Distance Learning. The paper explains,

To develop the ideas introduced in Joint Vision 2010 and 2020 for network centric operations, we need a high percentage of officers with a graduate level understanding of science, technology and management... We need to develop an officer corps with strong analytical and technical skills in areas of... information and decision sciences, organizational management, management of technology... (PAO, 2001)

To develop the officer corps, NPS must have the ability to be flexible in responding to the needs of its customers. The paper states that it is absolutely necessary to expand NPS's range of continuing education options to all officers. These officers

include those who are unable to attend NPS. Educational and Informational Technology (EIT) will allow NPS to reach many more students as discussed below:

The NPS vision for EIT requires that our faculty and staff are experienced in using modern technologies in teaching and learning. We must nurture and sustain efforts in multi-media technology, educational technology, and the technology of distance education. Through the use of distance learning technologies, students on campus and at remote sites at sea, across the nation, and throughout the world will be provided broad access to the faculty and facilities on campus. Telecommunications and EIT will make it possible for NPS to have an “expanded” campus through which we can provide education how, when and where there is demand. (PAO, no date)

Distance Learning is one of the methods to provide the knowledge required for our forces of today and tomorrow.

## **9. Naval Postgraduate School is in Sync with the Fleet**

Published in the January 2001 issue of *Proceedings*, Admiral Ellison offered amplifying comments in reply to a series of articles that appeared previously about NPS. The Admiral responded to articles by Admiral Henry Mauz (Retired), Admiral Stanley Arthur (Retired) and Lieutenant Commander Janice Graham. The contents of the article are essentially the same as the article in the previous subsection.

However, Admiral Ellison does explain the mission of NPS:

The primary mission of the NPS is to provide relevant, excellent and innovative education to Navy and Marine Officers throughout their careers. To do this effectively, the joint and combined nature of military affairs demands that NPS incorporate military and defense civilians from around the world in the education process. NPS must produce technologically competent warriors, rigorous analysts schooled in the most promising innovative military technologies, and critical thinkers, who later in their careers, are capable of assuming demanding roles at the center of the defense requirements/resource allocation process. (Ellison, 2001)

As difficult as this mission might be to accomplish, Admiral Ellison states that NPS will “provide the education when, how, and where it is needed” to Navy and Marine Officers throughout their career.

## 10. Naval Postgraduate School: “Our Corporate University”

This paper, written by Admiral Ellison, lauds NPS as the Navy’s corporate university. As the Navy’s corporate university, “NPS must have the capability to respond rapidly to the changing needs of the Navy and the Department of Defense while maintaining the highest quality academic and research programs.” One of the ways that NPS will respond is to become agile and adjust to a rapidly changing security environment. Admiral Ellison explains,

...We must continue to create programs that educate officers for their primary jobs and not just for one or two tours in a particular subspecialty. We are closely scrutinizing the duration and content of all our curricula to insure that we are being efficient (in consideration of resource and career path requirements) and that we are in sync with the future needs of the Navy and the broader joint arena within the Department of Defense. (Ellison, 2001)

NPS is already responding to the future needs of the Navy. Of the former Systems Management section, Admiral Ellison states:

Our business programs are responding to the need for officers who can critically and analytically address today’s complex and challenging defense problems. We are developing an eighteen-month MBA program (to include JPME) with a strong analytical core and disciplinary concentrations that will satisfy the specific needs of the subspecialties. (Ellison, 2001)

Although NPS aims to satisfy the needs of the subspecialties, the goals of NPS are grander. Admiral Ellison states that the overall goal of NPS is to “provide our officers with the fundamental skills needed to excel in all aspects of their Naval careers and not just to support sub-specialty requirements.”

As the Navy’s corporate university, NPS is working towards expanding the range of continuing education options to all officers. From other discussions throughout our research, it became evident that many prospective students were turned away from enrolling in their first choice of curricula at NPS because they did not meet the prerequisites for that course of study. Admiral Ellison explains how one of the many growing educational opportunities might increase NPS eligibility:

NPS is moving toward providing an educational experience that will continue throughout an officer's entire career. We are aggressively moving to push educational opportunities out to the Fleet. These opportunities will include Distance Learning courses to improve eligibility for any of the NPS curricula. (Ellison, 2001)

Prospective students might use a future Distance Learning program to make him/her eligible for more courses of study.

## **11. NPS Journal Volume I, Issue I**

This journal is going to be published quarterly by the NPS Public Affairs Office (PAO). This issue was published for the first fiscal quarter of 2002, although no printing date can be found in the text. The journal appears to be PAO information praising NPS and reprints Admiral Ellison's *Proceedings* article, "A View to the Future."

The periodical also contains another article reprinted from [Alumni@NPS](mailto:Alumni@NPS). Entitled "Bush Selects Two NPS Operations Research Graduates as Service Secretaries." This article highlights the secretaries of the Army and Air Force, two NPS graduates. The two men have said good things about an NPS education and education in general. This is important because it shows us what very senior leadership feels concerning graduate education. The Secretary of the Air Force, James G. Roche, said,

An officer should be a well-educated person. You don't have to justify education for what it does in an officer's next tour – the benefits come over time... The notion of thinking, the intellectual component of the military profession, is one that has to be honed. That was a long term reason that the Naval Postgraduate School was formed, and it is one that I think is applicable today, maybe even more so because now the rate of technology change is higher. (NPS Journal)

The Secretary of the Army, Thomas E. White, echoed similar comments during his Senate confirmation when he promoted education as "the continuous personal and professional learning required to take maximum advantage of technological advances.

As the guidance from the Army and Air Force Secretaries trickles down to senior subordinates, we may see higher NPS enrollment and increased promotion rates for NPS graduates.

## **12. NPS Distributed Learning Migration Plan**

We located this document on the NPS web page. We discussed this document with the NPS Director of Strategic Planning. He said that the document was outdated and no longer valid.

## **13. NPS Web Page: Distributed Learning and Video-teleconferencing Courses**

We investigated the NPS website for information regarding the courses of study available through distance learning at NPS. For the purposes of our research question, one statement on the web page stands out. “Courses require only three to five hours per week of classroom participation and are conducted during normal working hours.”

## **14. Why the Naval Postgraduate School?**

In March 2001, LtCol Barber, the Marine Representative at NPS, submitted an article to the Marine Corps Gazette. The article was accepted, but not published. LtCol Barber’s views and observations, though unpublished, are enlightening and have merit in a discussion of enrollment at the Naval Postgraduate School. LtCol Barber wrote this article in response to a low application rate to Marine Corps Special Education Program (SEP) selection boards. (D. Barber, personal interview, November 20, 2001).

LtCol Barber lists three reasons why Marine Officers don’t flock to NPS: The most significant reason is that senior officers impress upon their subordinates that going to NPS takes an officer out of his military occupational specialty (MOS) and hurts his chances for promotion. A second perception is that those officers that go to NPS are putting their needs ahead of the Marine Corps and preparing themselves for a career outside the service. Lastly, there is a perception that an NPS education is a “ticket to a tour at the dreaded [Headquarters, Marine Corps].

LtCol Barber then explains advantages of an NPS experience. First, the joint nature of the student body, coupled with association of foreign students gives Marine Officers both joint and combined perspectives on many strategic, operational, and technical challenges facing our services and allies.

Second, while typical civilian graduate schools teach 486 hours per year, an NPS student normally attends 768 hours per academic year. NPS is able to produce graduates at a higher rate than typical civilian schools.

Third, NPS offers a transition program for postgraduate education. NPS allows students to complete undergraduate prerequisites and refresher courses so that students are able to earn a postgraduate degree in a field foreign to them. LtCol Barber uses the example of Navy Captain Winston Scott, a participant in NASA's space shuttle program. Captain Scott was an undergraduate music major who earned a degree at NPS in aeronautical engineering.

The final advantage of an NPS experience is an excellent opportunity to complete their requisite Professional Military Education (PME). Taught by adjunct faculty through the Marine Corps University's MCAS Miramar office, virtually all Marine Officers attend after hours PME lectures and complete their PME requirement before graduation from NPS.

LtCol Barber believes that the Marine Corps needs officers to attend NPS. The Marine Corps must have the expertise of NPS graduates to fill billets requiring exceptional technical and managerial skills. Eighty-five of the 400 SEP billets that Marine Corps officers fill are at Marine Corps Systems Command (MCSC) or at Marine Corps Tactical System Support Activity (MCTSSA). These commands are responsible for developing, testing, and procuring new ground systems for the Marine Corps. Without the expertise of NPS graduates, these commands would be without the necessary capability to provide information and recommendations on crucial Marine Corps issues.

The article closes with some data and conclusions about officer retention rates. LtCol Barber analyzes two sets of data. First, he looked at all NPS graduates over 20 years for which data was available:

[Manpower and Reserve Affairs] reviewed the retention status for the 1,227 NPS graduates between 1980 and 2000 for which data was available. Only 159 (13%) left prior to retirement. Another 407 Marines retired with an overall average of 22 years of service. The remaining 661 are still on active duty – some well past 20 years of active service. It should be pointed out that some of the 661 do not have 20 years of active service and could resign their commissions thereby increasing the 13% retirement rate. (Barber, 2001)

Then LtCol Barber analyzed data for the FY80 year group and showed that SEP appears to be a major factor in retention:

Another way to look at retention is by examining the effects of attrition on a particular year group. M&RA looked at the FY80 year group that consisted of 1,501 officers. These officers gradually attrited so that today only 13.6% of them still remain on active duty. Three times the overall rate for the year group! Now an astute person will point out that officers are usually assigned to NPS as Captains and by that time, significant attrition has already occurred in the year group. To normalize for this, I looked at the retention of only those officers who completed six years of commissioned service. These officers are generally “Career Oriented” in that by this time most officers will have served their initial service obligation and received regular commissions. For the FY80 year group, 1,019 or 68% of the commissioned officers were still on active duty. Subtracting the 57 Marines that went to NPS, leaves a non-SEP population of 962 officers. Today, 19% of these officers remain on active duty – less than half of the SEP retention rate. Additionally, the retention of SEP trained officers was actually almost 40% higher from the 10 to 20 year mark of the year group. So, far from being an exit strategy, SEP actually appears to be a major factor in retention. (Barber, 2001)

LtCol Barber smartly showed that NPS and its follow-on tour for Marines does not end their careers nor lead to retention problems. Rather, NPS provides Marine Officers with the necessary technical, analytical, and managerial skills to succeed.

In Chapter III, we reveal the results of an interview with LtCol Barber.

## **15. The Value of the NPS Graduate**

The *Marine Corps Gazette* published “The Value of the NPS Graduate” in April of 2000. Written by Russell Bergeman, this article argues that NPS graduates bring a significant contribution to the Marine Corps upon their return to the operating forces. In making his argument, Bergeman outlines some information that is important to our discussion of enrollment at NPS.

Concerning a payback tour, the Marines who attend NPS incur a 4-year commitment upon graduation and are expected to complete a 3-year payback tour. This payback tour is mapped to utilize the knowledge and skills learned in a specific curriculum. A Marine may be out of the operating forces and his primary military occupational specialty for up to six years.

Second, although promotions while at NPS aren't guaranteed, Marines who attend NPS are usually promoted to the next higher rank. This near perfection in the promotion rate is not due to promotion boards' awe of NPS, but rather the prescreening process for admission to NPS. The NPS selection board tries to select officers for NPS that appear to have a military record that makes them competitive for promotion. Marines that aren't competitive for promotion are unlikely to be selected to attend NPS. Therefore, Bergeman points out that the pool of Marines at NPS is not representative of the officer corps as a whole.

Finally, Bergeman argues that officers should serve in payback tours immediately upon graduation. Knowledge and skills learned at NPS are perishable, regardless of the curriculum.

## **16. Marine Corps Special Education Program (SEP) Billet Education Validation**

Marine Corps Combat Development Command and the Manpower and Reserve Affairs published a message on July 19, 2001. The purpose of the message was to initiate Phase II of the Marine Corps SEP Billet Review. Paragraph two of the message summarizes the billet review:

...The SEP exists to provide graduate level education for Marine Officers in order to fill billets requiring these specialized skills. During the February 2000 SEP conference, the need to validate all SEP billets was identified. The SEP billet validation is being conducted in two phases. Phase I established the baseline by documenting and categorizing current SEP billets and updating all SEP Billet Education Evaluation Certificates (BEECs)... The purpose of this message is to initiate phase II during which the skill, training, and education requirements for each SEP billet will be reviewed and validated. The phase II review will not result in billet deletions; however, it may modify or eliminate the requirement for a SEP MOS for specific billets. It may also identify billets that, although requiring some special training do not require a SEP trained officer... (USMC message, 2001)

The Marine Corps uses NPS to train its officers for follow-on utilization tours. Marine Corps Officers are expected to work in a special billet using their new knowledge and skills. The SEP billet validation, by the end of phases II, will justify all SEP billets. The billet validation will further identify those SEP billets that can be filled with an

officer who may be educated with less than an NPS degree, but yet still perform his duties.

## **B. CHAPTER SUMMARY**

The purpose of this chapter was to obtain and discuss published works that were significant in our examination of the costs and benefits associated with NPS' DL and MBA programs. We used these published works to discover possible stakeholders and their values. Finally, we found that conflicting opinions exist on the level of NPS' efficiency and effectiveness with regards to graduate education as NPS tries to remain relevant to the Navy.

### **III. METHODOLOGY**

#### **A. OVERVIEW**

In this chapter, we discuss the steps we will take in our cost-benefit analysis. Second, we will review Little's Law and define the terms of Little's Law with respect to our thesis question. Third, we will review the student survey we conducted.

#### **B. STEPS TO A COST-BENEFIT ANALYSIS**

The first chapter of the textbook, Cost-Benefit Analysis: Concepts and Practice, written by Boardman, Greenberg, Vining, and Weimer, provides an introduction to conducting a cost-benefit analysis (CBA). We will use the first four of nine steps of CBA outlined in the textbook. The first four steps include specifying a set of alternatives, deciding whose benefits and costs count, cataloguing impacts and selecting measurements, and predicting the impacts quantitatively over the life of the project. We will not use the last five steps suggested by the text for our CBA. The last five steps of the CBA include monetizing all impacts, discounting benefits and cost to obtain present values, computing net present value (NPV) of each alternative, performing sensitivity analysis, and making a recommendation based on NPV and sensitivity analysis. Since the last five steps are monetary based, we exclude them. Our thesis question concerns the effects of DL on enrollment numbers, not dollar amounts.

This thesis would be of greater value, we believe, had it been done *ex ante*, or before the implementation of the DL and MBA programs. As the DL and MBA programs are currently being implemented, our choice of CBA is limited. Therefore, we will be performing an *in medias res* study. An *in medias res* CBA is performed during the life of a project, rather than before a project begins or after a project ends. The strength of the *in medias res* CBA is that a policy decision may be changed before *all* the costs of a project are sunk.

##### **1. Step One – Specify the Set of Alternative Projects**

We will consider four alternative projects in this thesis. The four alternatives are:

- Maintain the status quo.

- The current NPS vision: Mandatory DL with an MBA program
- Mandatory DL with an MS program
- No DL with an MBA program

See Figure 1 below for a summary of the set of alternative projects.

Mandatory DL	MBA Degree
Yes	Yes
Yes	No
No	Yes
No	No

Figure 1. Set of Alternative Projects

## 2. Step Two – Decide Whose Benefits and Costs Count (Standing)

In step two, we will list all the parties that have standing and how the DL and MBA policy decisions affect them. The parties that have standing that we will examine are: Individual officers, the Navy, the Marine Corps, the Navy Community Sponsors, and NPS. We will assume that the faculty doesn't have a significant bearing on the enrollment at NPS.

## 3. Step Three - Catalogue the Impacts and Select Measurement Indicators (Units)

Simply, the possible impacts we will consider are that the enrollment at NPS will increase, decrease, or stay the same. We will measure in numbers of students.

## 4. Step 4 - Predict the Impacts Quantitatively Over the Life of the Project

The decision to implement both a mandatory DL program and an MBA program will have an impact on enrollment. Our analysis will predict the direction enrollment will take after full implementation of the DL and MBA policy decisions. We will predict the impact of these policy decisions on future NPS enrollment in three ways:

- A comprehensive application of Little's Law
- A student survey
- Logical reasoning from critical data

The application of Little's Law will enable us to quantitatively reason which direction enrollment will go considering the possible alternative projects. In addition to conducting a student survey, we will obtain critical data from a variety of sources in order to discern the desires and values of the parties that have standing. We believe that the values of the parties we consider will determine the future enrollment at NPS.

In the next sub-sections, we review Little's Law and the survey.

## **C. REVIEW OF LITTLE'S LAW**

### **1. Overview**

In this section, we introduce and review Little's Law. Little's Law is a basic logistics equation put forth in 1964 by John D. Little, a professor at MIT. The relationship of the variables follows simple mathematical constructs, and the linear equation is used extensively throughout the study of logistics. Later, in Chapter V we will apply Little's Law to the current problem.

### **2. Little's Law Variables Defined**

The specific mathematical formula for Little's Law is defined as:

$$\text{Inventory} = \text{Throughput} * \text{Cycle-Time} \text{ or } \text{INV} = \text{TP} * \text{CT}$$

Inventory or INV is the average number of items in a system at any time. Throughput or TP is the rate (in terms of units per time) at which the system produces an item. Cycle-time or CT is defined as the amount of time it takes one unit to get through the entire system. Finally, an effective analysis of Little's Law requires an examination of the variables in a steady state.

### **3. Variables Defined for the Current Problem**

In our problem, INV is equal to the average number of students/officers onboard at NPS at any given time throughout the year. In other words, INV is equal to current enrollment. TP is equal to the number of degrees awarded each quarter. CT is equal to

the average length of time on station in quarters. Therefore, the logistical equation for enrollment at NPS is:

$$\text{Avg Students Onboard} = \text{Number of Degrees per Quarter} * \text{Avg Time on Station (Qtrs)}$$

## **D. REVIEW OF THE STUDENT SURVEY**

### **1. Overview**

The following section discusses our survey. First, we give an overview of the survey and discuss its focus, structure, and format. Second, we discuss difficulties in conducting the survey and how it affected our research. Next, we discuss why and how the survey questions were framed. Finally, we list the survey questions. For each question, we provide a justification for including the question in the survey and what information we hoped to glean from the possible answers.

We conducted a survey of the NPS student body, focusing primarily on the students from the Graduate School of Business and Public Policy (GSBPP). We did this because most of the programs in the GSBPP are 18 months long. Additionally, the MBA programs are focused in the GSBPP. However, as all students at NPS are a cross-section of the service, it was important to get as many opinions as possible. It was important to find out whether mandatory distance learning classes would make NPS so unappealing that officers would not apply to NPS and seek graduate education elsewhere. Using the survey, we hoped to find out if distance learning would increase enrollment.

The survey began with a short one-page summary. The summary stated that the purpose of the survey was to gather student opinions about NPS and graduate education opportunities concerning Videoteleeducation (VTE) and Web-Based Instruction (WBI). Furthermore, the survey provided the respondents with a short background of what we thought were the impediments to enrollment at NPS. The reduction of authorized end-strength coupled with a long resident requirement at NPS hinders enrollment. There are fewer students in the available base able to leave the fleet for graduate education. In addition, the time away from the fleet for those that choose to come to NPS may dull perishable fleet skills and hamper chances for promotion.

The survey summary offered two solutions to the enrollment problem: NPS would use DL to shorten the required time-on-station to earn a graduate degree and also offer an MBA. The MBA program would seek to attract those prospective students that would not come to NPS for an MS.

We asked only 12 questions. We wanted the survey short enough that respondents could answer all the questions within a period of 10 minutes. We thought that the respondents would remain focused for at least 10 minutes and provide us with thoughtful answers.

Initially, we intended to publish the survey on a web page. We were going to email the student body with the survey location and ask them to take our thesis survey. Talking to other survey creators, this seemed like a good idea. Immediately prior to publishing the survey, however, NPS disallowed web surveys on the campus citing Naval Instruction 5300.8b. This instruction forces survey takers to have their survey approved through official Navy channels. Therefore, we physically distributed the survey throughout out classes at NPS. We believe targeting these students added great benefits to our results. We know that the respondents were mostly GSBPP students. We also know that the respondents had opportunity to clarify any misunderstandings caused by possible poorly written questions. In fact, we rewrote three survey questions after administering the survey to 20 people. We believe that rewriting these questions added value to the survey.

## **2. Framing the Questions**

We believed that forcing potential students to complete DL classes prior to becoming a resident at NPS would cause enrollment to drop. Therefore, it was important to us that the questions weren't framed in such a way to elicit answers that echoed our suspicions. Although we approached this research with an open mind, we did suspect that the number of students interested in NPS would decline should DL be required prior to becoming a resident at NPS. Therefore, we chose our questions to somewhat suggest that we supported required distance learning to avoid the perception that we did not favor mandatory distance learning. We did not want to skew our findings in the direction of our bias.

### **3. Purpose of each Question**

The questions that we asked were chosen specifically to draw out desired data from the respondents.

#### ***a. Question 1***

Question 1: What is your service?

It was important to know what service each respondent was in because of the joint nature of our thesis. Our thesis questions treat the Navy and Marine Corps differently, and we expect to offer enrollment solutions for our respective services.

#### ***b. Question 2***

Question 2: What is your rank?

We hoped that knowing the ranks of the respondents would give insight into their motivations of pursuing graduate education. Students of different ranks are in different places in their career progression. We might be able to show what officer grade is the most likely target for the DL program.

#### ***c. Question 3***

Question 3: If you are in the Navy, you are best described as a(n)...

This question served to determine whether the Navy respondent was a URL or a staff officer. As NPS's enrollment problem centers on the URL student, we wanted to focus on the answers of the URL respondent. However, staff officer responses were equally valuable. Although we had a keen interest in the enrollment of the URL officer, we were still seeking to examine the entire enrollment of NPS's student body.

#### ***d. Question 4***

Question 4: If you are an Unrestricted Line Officer, you are best described as a...

Knowing the values of each URL community represented at NPS might show us how to target specific officer communities. Each URL community has a different career progression and different career concerns. How an NPS education fits into each community may provide insight into ways of increasing URL enrollment.

*e. Question 5*

Question 5: Are you a USMC pilot? If so, what do you fly?

As time out of the cockpit dulls perishable skills and may hamper promotion and billet opportunities, we desired to know the opinions of pilots. As fixed wing pilots are disproportionately underrepresented in the NPS student body, we wanted to focus on the opinions of these students in particular.

*f. Question 6*

Question 6: NPS may eliminate resident refresher and undergraduate core courses. These courses, however, would still be prerequisites for attending resident NPS. If NPS had required that you complete your refresher and core courses on your own time via VTE/WBI as a prerequisite to taking graduate courses as a resident student, would you have still attended NPS?

This question is the linchpin to our research. We wanted to know the bottom line. Would students still come to NPS if they had to complete DL courses prior to attending NPS as a resident student? As the most important question in the survey, it was asked early, hoping to have the full attention of the survey respondents. Again, we consciously framed this question neutrally in order to get unbiased answers.

*g. Question 7*

Question 7: Prior to reporting to NPS while working at your last command, did you have time to complete refresher and core courses via VTE/WBI before, during, or after your regular workday?

Question 7 serves to confirm and add value to the answers in Question 6. We wanted to know if prospective students would have had time to take courses via WBI/VTE at their last command prior to their reporting to NPS. We believe that an underlying detractor to completing courses on an officer's own time, is that his reporting senior is grading him against another Marine or Sailor who is not NPS bound. Leaving work early to complete graduate level courses as operational tempo continues to increase in the operating forces may bias a reporting senior against a DL student.

***h. Question 8***

Question 8: NPS's VTE/WBI courses may become available to all Marines and Sailors in the operating forces whether or not they are selected to complete their graduate degree at NPS. If NPS courses had been made available to you at your last duty station via VTE/WBI at little or no cost to you, would you have taken them?

One additional goal, which drives distance learning, is to offer higher education to the entire officer corps, and not simply to increase enrollment at NPS. The answers to this question will provide some analysis of possible benefits of the DL program. Benefits offered to the entire Navy may outweigh or counterbalance some of the possible negative effects that the DL program may have on NPS resident enrollment. This question serves to find out if Naval officers, in general, would take advantage of inexpensive graduate level courses to increase their own knowledge.

Unlike the other yes or no questions, this question had three possible responses. We gave an opportunity for the respondent to qualify a "yes" response. If a respondent answered positively, then he was able to choose if he would take advantage of NPS courses only after being selected for NPS or as an officer who simply did not apply to NPS for resident study. We also listed a negative response allowing the respondent to state that he would not have taken VTE/WBI regardless of the cost or career path.

***i. Question 9***

Question 9: NPS *may not* eliminate resident refresher and core courses. However, NPS may still offer refresher and core courses via VTE/WBI to prospective students who desire to spend less resident time at NPS. In order to reward your efforts to complete refresher and core courses via VTE/WBI classes on your own time, the government may reduce your incurred payback obligation after NPS. If NPS made VTE/WBI courses available that enabled you to reduce your required payback incurred by your graduate education, would you have completed them prior to becoming a resident student?

This question also measures the willingness of prospective students to complete graduate level courses on their own time. The possible answers are not just "yes" and "no," but include possible reasons for not completing DL courses. Although the question is framed to positively bias DL courses, the negative response suggests

possible reasons for not completing DL courses. The answers to this question will help us determine possible solutions to using DL to increase enrollment at NPS.

*j. Question 10*

Question 10: Which has more value to you – an MBA or an MS?

Question 10 will help us evaluate the effect of changing the MS degree at the GSBPP to an MBA degree. This question will determine the desires of those seeking graduate education and whether there is a bias towards one particular degree. Will changing the degree offered by NPS positively or adversely affect enrollment? Will officers' perceptions of an MBA outweigh any negative effects of the resident time required to earn a graduate degree? Enrollment may increase if NPS offers a degree that most officers are seeking.

*k. Question 11*

Question 11: Which has more value to your service – an MBA or an MS?

For some services, the type of degree is important. For others, the only requirement to advance to higher ranks is a graduate degree of any kind. This question was posed to determine what kind of degree is desired by the different services/communities. Enrollment may decrease if NPS doesn't offer the degree that services desire.

*l. Question 12*

Question 12: How would you increase enrollment at NPS? How would you increase NPS's appeal to prospective students?

Question 12 is an open-ended question. We left significant space to hear officer opinions. We hoped to get some insight into what makes NPS appealing to the student body. Increased enrollment means attracting more officers. What do officers want in graduate education?

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## **IV. DATA OBTAINED**

### **A. OVERVIEW**

In this chapter, we present the data that we collected in our research. First, we will summarize the status of both the DL and MBA programs. Second, we will share data from interviews with Navy and Marine Corps leadership. Lastly, we will provide enrollment, graduation, and promotion data that we obtained from several sources.

### **B. SUMMARY REVIEW OF THE NPS DL PROGRAM**

Very little is published about the NPS DL program, which is in its infant stages. For the current status of the DL program, we interviewed the NPS Executive Officer for Education Technology.

Work is currently underway to build DL courses at NPS through funding from the Navy's N7. Chief of Naval Education and Training (CNET) gives NPS enough funds to construct six to eight courses per year. Each course costs \$25-30,000 to build. In the Knox Library, NPS installed a DL Resource Room where faculty members are able learn how to construct DL courses. Pay incentives encourage faculty members to participate.

Classes are already being offered to government civilians off campus at Fort Monmouth in New Jersey and Fort Campbell in Kentucky. NPS "designs custom curricula to meet an agency's specific graduate-education needs in engineering, applied sciences, operational research, or management. Courses are paid for by the sponsoring agency on a negotiated, fixed-fee basis." (NPS Distributed Learning web page, 2001) Fleet commands are responsible for paying for the delivery cost of the DL courses. NPS hopes to stand up satellite campuses in both San Diego and Norfolk by next year to begin servicing the active duty population. In fact, collaborators have had initial discussions for the San Diego site.

Although the implementation timeline is uncertain, the vision of DL's future is clear. NPS will use DL to increase access and educational opportunities for servicepersons and government employees to learn. Education will be available to anyone who can get financial sponsorship.

The NPS vision concerning DL has three main points. The points are:

- NPS is a graduate institution. NPS will find substitutes for resident refresher work. Refresher work will be completed by DL or outsourced.
- The NPS education will eventually be a morphing of resident and DL study. NPS desires a hybrid form of education – an appropriate combination of WBI, VTE, and resident study.
- The final DL product will be so effective that there will be no distinction between the resident NPS experience and any DL experience that the school might offer. This will allow students who can't come to NPS for resident study an opportunity to get the same high quality education at a distance.

The NPS Distributed Learning web page supports this last bullet. It states, “Although students are not physically on campus, they are virtually in residence at NPS through the latest in real-time, interactive-video-teleconferencing technology.” (NPS Distributed Learning web page, 2001)

### **C. SUMMARY REVIEW OF THE NPS MBA PROGRAM**

The Graduate School of Business and Public Policy (GSBPP) is currently building an 18-month Masters of Business Administration (MBA) degree program, which is scheduled to replace the 18 to 21-month Master of Science (MS) program in January 2002. Offering an MBA program will allow NPS to respond to current trends in graduate education and may attract more students from the fleet. Some sponsors and prospective students have indicated that an MBA may encourage increased enrollment at NPS. However, others argue that the switch from an MS degree to an MBA degree may eliminate the unique military nature of an NPS degree and eliminate a fundamental tenet of NPS's existence.

The MBA degree program is still in the design process. However, some of the basic aspects of the program are established. The basic framework of the MBA program includes the following:

- Group projects will replace the capstone thesis that MS students currently complete.
- The MBA will consolidate several of the curricula now offered under the current MS program.
- The MBA program will be 18 months long.

- Some refresher and core courses will be eliminated or consolidated, such as Calculus and Economics.

## **D. INTERVIEWS CONDUCTED**

In the course of our research, we conducted several interviews. We wanted to attack the problem from many angles and obtain the views of as many stakeholders as possible. We wanted to determine how leaders were currently addressing the problems of reduced enrollment and the need for a higher educated officer corps.

### **1. Interview with Director of NPS Strategic Planning, Carson Eoyang**

We interviewed the Director of NPS Strategic Planning, Professor Carson Eoyang. He suggested that there is a growing appreciation for the ability to gain a superior military advantage through a highly educated officer corps. Increased education allows for increased problem solving ability in an ever-changing complex world. We agree. The NPS mission statement also supports increasing officer education to enhance national security. The NPS mission statement states that, “The mission of the Naval Postgraduate School is to enhance the security of the United States of America through graduate and professional education programs focusing on advanced studies directed towards the of the Navy and DoD.” (Eoyang, personal interview, September, 2001)

Professor Eoyang confirmed that the four main goals of DL were to reach more personnel, support continuous education of officers, promote educational growth of enlisted personnel (especially senior enlisted), and reduce student time on station. Furthermore, Professor Eoyang stated that the current on station time was approximately 22.8 months with a future goal of 18 months (Eoyang, *ibid.*).

The first three goals of DL allow NPS to expand its student base, which should ultimately reduce per student fixed costs of operations at NPS. However, any reduction in student time on station would increase per student fixed costs and decrease variable costs, which mainly consist of student salaries. The solution would be to send more officers to NPS. More officers at NPS would then drive down fixed cost per student at the expense of driving up variable costs. In our chapter on cost-benefits, we will explore this dilemma in more detail.

**2. Interview with NPS Executive Officer for Education Technology, Tom Hazard**

The summary of this interview can be found in Section A of this chapter.

**3. Interview with Assistant Provosts for Strategic Planning and Institutional Advancement George Conner and Julie Filizetti**

We interviewed George Conner and Julie Filizetti who are Assistant Provosts in the NPS Office of Strategic Planning, Educational Assessment and Research. They stated that NPS tried Distance Learning before. Back in the 1970's, NPS tried to institute DL through correspondence courses and the result was dismal. They cited that the current average dropout rate for NPS Web Based Instruction (WBI) is 50 to 80 percent. If the courses are a mixture of WBI and VTE the drop out rates are much lower.

With such a high dropout rate, NPS is forced to secure signed contracts from the student's supervisor prior to approving enrollment. The contract guarantees that the employer will allow ample time for the employee/student to participate in the course and to complete required studies. If an officer is required to obtain such a document before his/her enrollment into NPS, this may discourage some officers from pursuing a master's degree through DL.

Finally, Mr. Conner also confirmed Professor Eoyang's statement that the current average time on station for students was 22.8 months. Mr. Conner also reaffirmed that one main goal of DL was to reduce student time on station. (Conner and Filizetti, personal interview, October, 2001)

**4. Conference Call with USMC Special Education Program (SEP) Monitor and USMC Officer Inventory Planner**

On September 24, 2001, we conducted a phone interview with both the USMC SEP Monitor and the USMC Officer Inventory Planner. The objective of this conference call was to determine the Marine Corps' position on our research question. If NPS reduced cycle time, would the Marine Corps send more officers to NPS? The answer was, "no."

The number of NPS-educated officers required by the Marine Corps is constant. The Total Force Structure Division (TFSD) at the Marine Corps Combat Development

Command (MCCDC) determines the requirements for NPS-educated Marine Officers. Currently, TFSD is performing a SEP billet validation as discussed in Chapter 2, Section 16. The intent of phase I of the billet validation is to establish a baseline of billets that require a SEP graduate. Phase II of the billet validation will review and validate the skill, training, and education requirements for each SEP billet. It is unlikely that requirements will change significantly.

In order to add a requirement for a SEP billet, a command must complete a Billet Education Evaluation Certificate (BEEC). The command must justify why the new billet requires an NPS graduate. Second, the Marine Corps must also give up a SEP billet somewhere else in its Table of Organization. The SEP monitor called the requirements process a “zero-sum game.” A gain of a SEP billet at one command must come from a SEP billet loss somewhere else in the Marine Corps. The number of SEP requirements must remain the same over time.

The Marine Corps is authorized an end strength of 172,600 Marines and has a Table of Organization to meet that end strength. However, the Marine Corps can't fill all its billets. At every moment, 28,000 Marines are unavailable to man their assigned billets. They are in what is referred to as “P2T2,” or Patients, Prisoners, Training, and Transients. Of 172,600 Marines, 28,000 are in the hospital, in the brig, in school, or in between duty stations. In fact, 66 percent of the 28,000 are in their initial training or participating in resident Professional Military Education (PME). Any increase in officers assigned to NPS will increase P2T2 and negatively affect fleet readiness.

Even if the number of Marine Corps SEP billets increased through the SEP validation above, it is unlikely that the Marine Corps will be able to encourage the additional officers to apply to NPS. Today, although the enrollment of Marine Officers is ever increasing, the Marine Corps cannot fill all the available SEP spaces at NPS. For the past several years, the Marine Corps has had to conduct supplementary admissions boards for the SEP program because the requisite number of Marine Officers are not interested in coming to NPS. The SEP monitor blamed a poor perception of NPS in the fleet.

Senior Marine officers generally do not value NPS. Young officers are counseled against applying to NPS. The fleet regards a tour at NPS as self-serving, readying an officer for the civilian world. The NPS tour is also regarded as easy and “cushy.” Marine Officers enjoy a good quality of life at NPS while their peers are “working hard” in the fleet. This perception problem is a significant factor in the Marine Corps’ inability

to fill all their SEP billets at NPS. Interest and perception are not the only hindrances to enrollment of USMC Officers at NPS. The next section will explain.

### **5. Interview with USMC Representative, Naval Postgraduate School**

On November 19, 2001, we interviewed the Marine Corps Representative at NPS. When asked what was keeping the Marine Corps from filling all their billets at NPS, LtCol Barber stated that officers don't apply for a number of reasons.

First, NPS takes an officer out of his MOS for five years. This may be too long with the promotion speed to Lieutenant Colonel. Unlike the past where officers weren't considered for lieutenant colonel until their 17<sup>th</sup> year, officers today can be selected to lieutenant colonel in 14 years. This three-year difference equates to one full tour. Officers must now prove their worthiness to be promoted to O-5 in three years and one tour less than before. This makes the five years spent outside their MOS at NPS and in their payback tour very significant.

Second, many officers don't qualify for NPS. The Marine Corps needs 120 Marine Officers to be educated by NPS across a spectrum of curricula. Although last year 150 officers applied, 60 initially didn't qualify. They generally didn't meet the academic prerequisites of the more technical curricula. The problem is that officers don't get enough math from their civilian undergraduate schools. A DL course that would be helpful, LtCol Barber said, would be a math course to prepare officers for selection to NPS.

Lastly, Marine Corps enrollment at NPS is inhibited by influence from senior officers. The NPS distinguished alumni listed in Appendix A of the current NPS catalog lists only three general officers with NPS degrees – one infantry officer and two supply officers. Although NPS graduates have a nearly perfect promotion record to O-4, the low promotion rates of NPS graduates to flag rank makes us wonder whether the Marine Corps value NPS graduates. The high promotion rate to O-4 is easily explained. Marine Officers selected to NPS have already been screened. The USMC NPS selection process has determined that officers selected to NPS have a record strong enough for promotion.

LtCol Barber had two additional comments. First, NPS is not a Marine Corps retention incentive, but a tool to fill specific billets. Therefore, the Marine Corps is concerned about quality. The Marine Corps needs technical courses and doesn't want to

see the curricula “watered down.” Interface with professors and interchange with other students is important.

Second, LtCol Barber suggested that shortening the cycle time at NPS might not benefit the Marine Corps or the individual Marine. Deleting the first three months of an 18-month resident program only saves the Marine Corps 5.5 percent of the time an officer spends out of his MOS when you consider the three-year subspecialty payback tour (3 months / (18 + 36) months). The DL program might get the Marine back to the fleet three months sooner than before, but it might not. Officers that are due to rotate in the winter might request to stay at their duty station extra time in order to become a “summer mover.” For example, an officer due to move in December might opt to stay at that duty station until the following June in order to become a summer mover. Being a summer movers is preferred because of dependants’ school year considerations.

## **E. CRITICAL DATA OBTAINED**

In this section, we present critical data, which we collected during our research. The data includes enrollment at NPS, average time on station at NPS, the number of degrees awarded from NPS, the promotion rates of Marine Corps NPS graduates versus non-NPS graduates, and the promotion rates of Supply Corps officers with post-graduate education versus Supply Corps officers with only an undergraduate degree. We also explore how graduate education effects officer promotions.

### **1. NPS Enrollment**

The NPS Registrar’s Office provided us with significant data concerning student enrollment for the academic years 1995 through 2001. The data includes the number of students on station broken down by student’s service or country and curriculum. Navy students are further identified by designator, which reveals the type of job the Naval officer performs and whether the officer is an Unrestricted Line (URL) Officer, Restricted Line (RL) Officer, or Staff Officer. The table and graphs in Figures 2 through 9 below provide a consolidated summary review of NPS enrollment for the years 1995 through 2000.

*a. Average Total Annual Enrollment at NPS*

Figure 2 provides total average students onboard for the years 1995 through 2000. Between 1995 and 2000, average annual enrollment at NPS decreased 275 or 17.7 percent. However, if we start with enrollment from year 1996, than total annual enrollment between 1996 and 2000 only decreases by 118 or 8.4 percent. We eliminate 1995, since 1995 was the last year of the officer manpower draw down and a stabilization of officer end-strength is evident for the years 1996 through 2000. Please see Table 1, page 1 of this text for officer end-strength data. We can also see some stabilization for NPS enrollment during the same period.

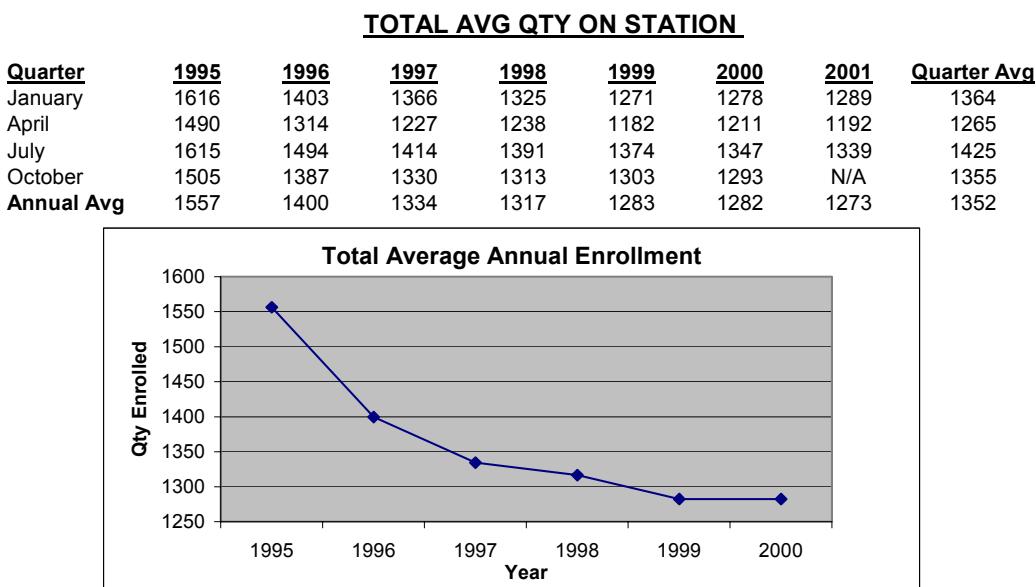


Figure 2. NPS Annual Enrollment 1995 – 2000

**b. Navy Annual Enrollment at NPS**

Figure 3 provides average enrollment of Naval Officers at NPS during the years 1995 through 2000. Between 1995 and 2000, average annual Navy only enrollment at NPS dramatically decreased by 37.4 percent or 389 students. If we start with Navy enrollment from year 1996, then total annual Navy enrollment between 1996 and 2000 still decreased by 242 or 27.1 percent. The majority of reduction in Navy enrollment comes from the Navy Surface Warfare Officer (SWO) and Aviation communities, as we will see in future graphs and tables of those respective communities.

<u>Quarter</u>	<u>QTY NAVY ON STATION</u>							
	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>Qtr Avg</u>
January	1120	894	869	770	683	654	625	802
April	1049	831	774	703	612	635	582	741
July	1043	967	864	778	730	682	670	819
October	953	882	775	715	688	638	N/A	775
<b>Annual Avg</b>	<b>1041</b>	<b>894</b>	<b>821</b>	<b>742</b>	<b>678</b>	<b>652</b>	<b>626</b>	<b>784</b>

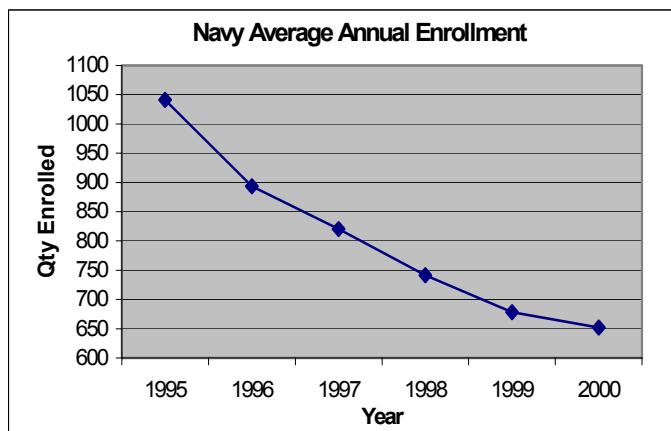


Figure 3. Enrollment of Naval Officers at NPS 1995 – 2000

*c. Navy Surface Warfare Officer (SWO) Enrollment at NPS*

Figure 4 provides average Navy Surface Warfare Officer (SWO) onboard at NPS for the years 1995 through 2000. Between 1996 and 2000, average annual SWO enrollment at NPS dramatically decreased 24.8 percent or 58 students.

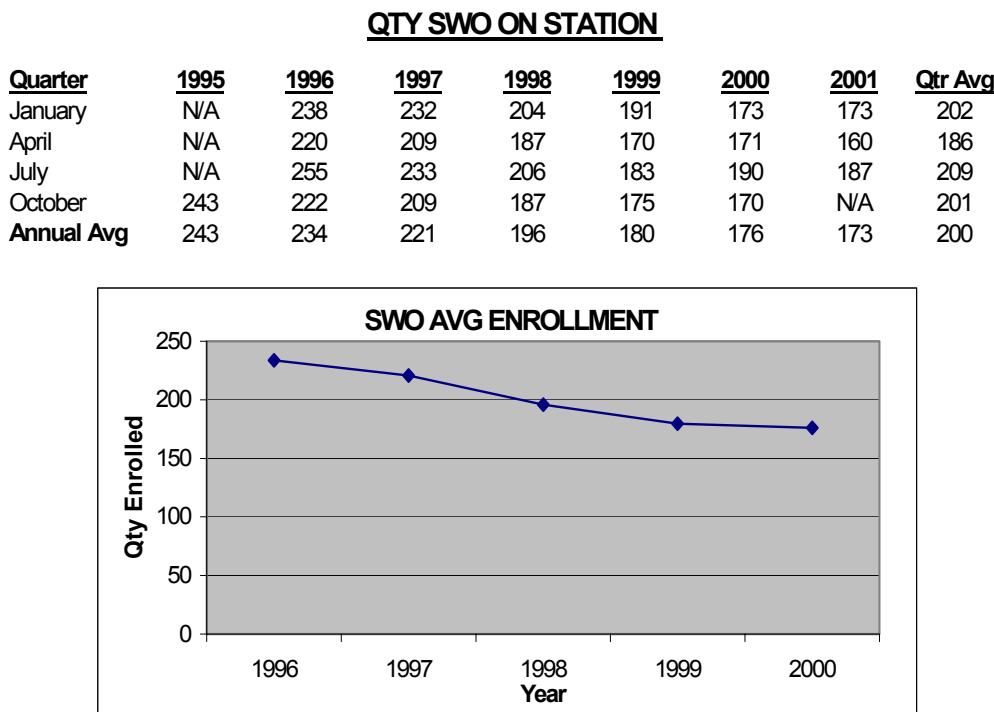


Figure 4. Enrollment of Surface Warfare Officers at NPS

***d. Navy Unrestricted Line Officer (URL) Enrollment at NPS***

Unrestricted Line Officers include SWOs, Pilots, Navy Flight Officers, Submarine Officers, Navy SEALs, and other Special Ops Officers. Figure 4 provides average Navy Unrestricted Line Officer (URL) onboard at NPS for the years 1995 through 2000. Between 1996 and 2000, average annual URL enrollment at NPS decreased even more than SWO enrollment. URL enrollment decreased 35.5 percent or 193 students. This is dramatic considering that between 1996 and 2000 URL manpower levels remained relatively unchanged. Please see Table 1, page 1 of this paper for officer end-strength.

**QTY URL's ON STATION**

<u>Quarter</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>Qtr Avg</u>
January	N/A	526	502	419	355	342	338	414
April	N/A	582	534	383	323	370	357	425
July	N/A	568	473	395	385	354	375	425
October	447	495	423	361	364	333	N/A	404
<b>Annual Avg</b>	<b>447</b>	<b>543</b>	<b>483</b>	<b>390</b>	<b>357</b>	<b>350</b>	<b>357</b>	<b>417</b>

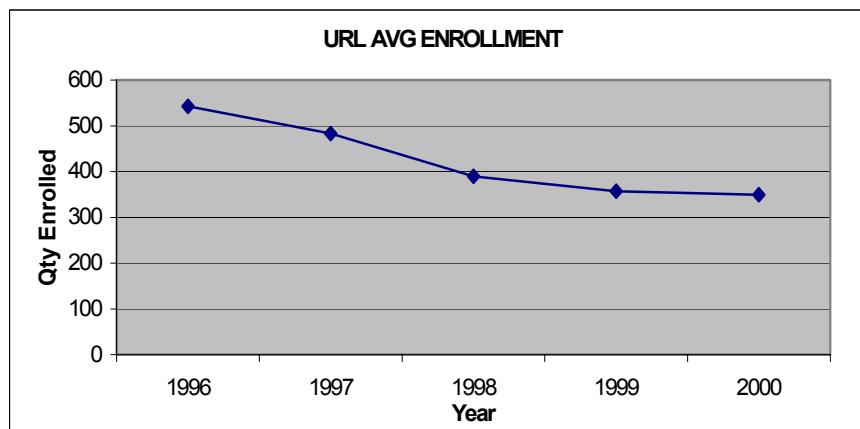


Figure 5. Enrollment of Unrestricted Line Officers at NPS

***e. Navy Pilot and Flight Officer Enrollment at NPS***

NPS enrollment of Navy Pilots and Navy Flight Officers (NFOs), Figures 6 and 7, drastically fell during the years 1996 through 2000. The combined enrollment of

these two critical officer communities dropped by 111 aviation students or by 59.3 percent. Furthermore, the drop in enrollment of Navy Pilots alone was even worse; enrollment of Navy Pilots dropped 70 percent. The pilot population went from 120 students in 1996 to a mere 36 in 2000.

#### QTY PILOTS & NFO's ON STATION

<u>Quarter</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>Qtr Avg</u>
January	N/A	215	190	154	110	84	81	139
April	N/A	193	158	129	98	76	80	122
July	N/A	223	175	129	107	84	77	133
October	215	185	149	113	91	87	N/A	140
<b>Annual Avg</b>	<b>215</b>	<b>204</b>	<b>168</b>	<b>131</b>	<b>102</b>	<b>83</b>	<b>79</b>	<b>133</b>

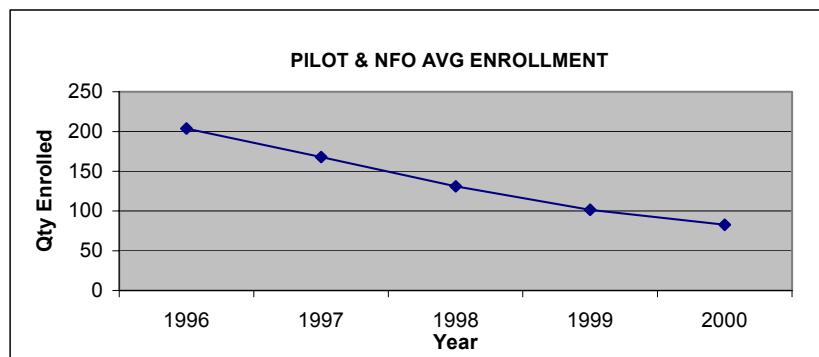


Figure 6. Enrollment of Navy Pilots and Flight Officers at NPS

#### QTY PILOTS ON STATION

<u>Quarter</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>Qtr Avg</u>
January	N/A	130	106	82	58	39	34	75
April	N/A	110	92	67	44	32	34	63
July	N/A	134	100	71	51	36	36	71
October	123	107	83	58	44	36	N/A	75
<b>Annual Avg</b>	<b>123</b>	<b>120</b>	<b>95</b>	<b>70</b>	<b>49</b>	<b>36</b>	<b>35</b>	<b>71</b>

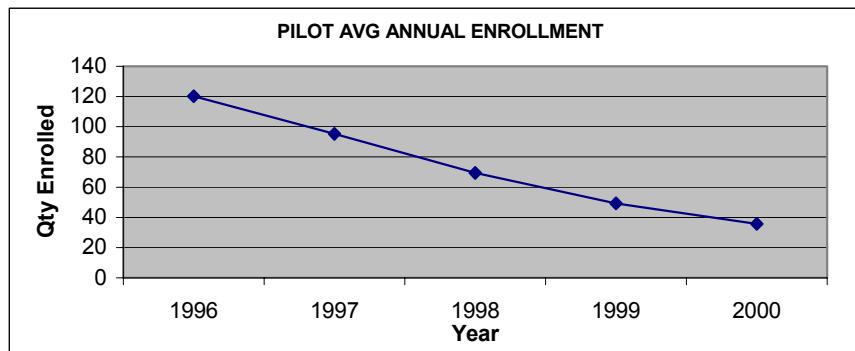


Figure 7. Enrollment of Navy Pilots at NPS

*f. Navy Supply Corps Officer Annual Enrollment at NPS*

Figure 8 provides average Navy Supply Corps Officer onboard at NPS for the years 1995 through 2000. Between 1996 and 2000, average annual Navy Supply Corps enrollment at NPS actually increased 7.9 percent or 5 students. This is one area of encouragement for NPS. While total numerical increase may not be as dramatic as the decreases in the SWO and Aviation communities, at least Supply Officer enrollment is headed in the right direction.

<b><u>QTY NAVY SUPPLY CORPS ON STATION</u></b>								
<b><u>Quarter</u></b>	<b><u>1995</u></b>	<b><u>1996</u></b>	<b><u>1997</u></b>	<b><u>1998</u></b>	<b><u>1999</u></b>	<b><u>2000</u></b>	<b><u>2001</u></b>	<b><u>Qtr Avg</u></b>
January	N/A	62	59	54	53	58	78	61
April	N/A	57	56	51	48	53	74	57
July	N/A	69	71	63	70	81	94	75
October	74	65	62	62	66	79	N/A	68
<b>Annual Avg</b>	<b>74</b>	<b>63</b>	<b>62</b>	<b>58</b>	<b>59</b>	<b>68</b>	<b>82</b>	<b>65</b>

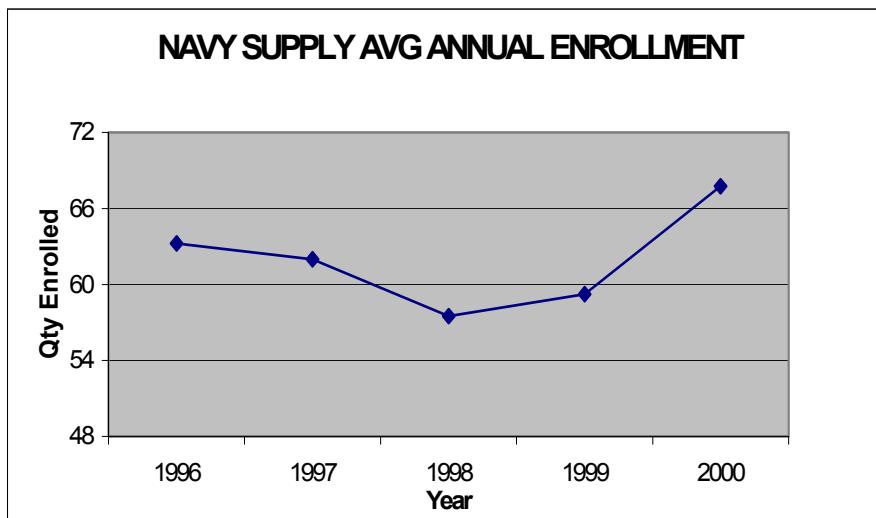


Figure 8. Enrollment of Navy Supply Corps Officers

**g. *Marine Corps Officer Annual Enrollment at NPS***

Figure 9 provides average Marine Corps Officer onboard at NPS for the years 1995 through 2000. Between 1996 and 2000, average annual Marine Corps enrollment at NPS actually increased 44.8 percent or 64 students. The total numerical increase and percentage increase of Marine Corps Officers enrolled is very significant.

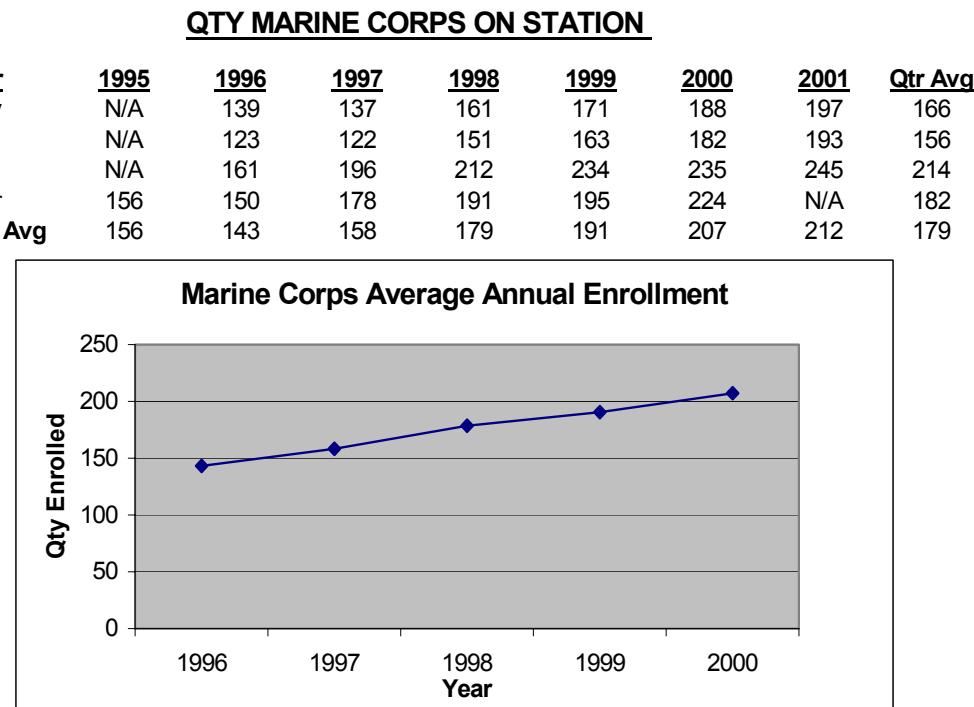


Figure 9. Enrollment of Marine Corps Officers

## 2. NPS Average Time on Station (TOS)

The NPS Registrar's Office provided us with the average time Navy and Marine Corps officers spent at NPS from 1995 to 2001. Below, Figures 10 and 11 provide a summary of Navy and Marine Corps TOS data. In 1995, the average Navy officer TOS stood at 25.29 months and in the following five years only declined 1.18 months or 4.67 percent to 24.11 months in 2000. The Marine Corps TOS remained in a constant, narrow range between 23 and 24 months. The figure of 22.8 months TOS previously provided by Professor Eoyang and Provost Conner included all NPS students. The 22.8 month TOS take account of all students, including U.S. Army and Foreign students who are generally enrolled in less technical and shorter curriculums. The TOS data provided below is for Navy and Marine Corps only.

<b>GRAD DATE</b>	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>Qtr AVG</b>
March	26.62	25.68	25.56	24.73	26.14	25.98	23.24	25.42
June	24.64	24.69	24.15	23.52	23.41	20.56	22.27	23.32
September	26.40	26.67	26.41	26.52	26.57	26.64	26.37	26.51
December	23.48	22.84	23.29	23.52	23.49	23.25	N/A	23.31
<b>Annual AVG</b>	<b>25.29</b>	<b>24.97</b>	<b>24.85</b>	<b>24.57</b>	<b>24.90</b>	<b>24.11</b>	<b>23.96</b>	<b>24.64</b>

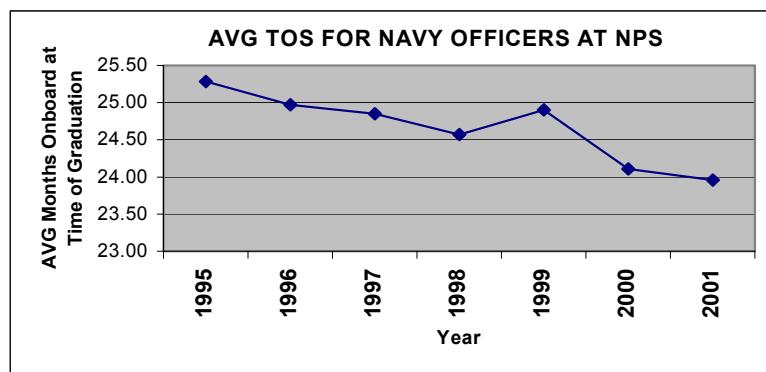


Figure 10. Average Time on Station - NPS Naval Officer at NPS

### AVERAGE TIME ON STATION FOR NPS MARINE CORPS GRADUATES

<u>GRAD DATE</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>	<u>QTR AVG</u>
March	23.00	24.07	24.33	25.18	24.00	21.50	22.33	23.49
June	23.67	22.58	23.85	25.33	23.65	23.79	20.41	23.33
September	26.94	26.65	26.87	26.29	26.87	26.95	26.85	26.77
December	20.20	18.73	18.00	19.33	18.92	20.13	N/A	19.22
<b>Annual Avg</b>	<b>23.45</b>	<b>23.01</b>	<b>23.26</b>	<b>24.03</b>	<b>23.36</b>	<b>23.09</b>	<b>23.20</b>	

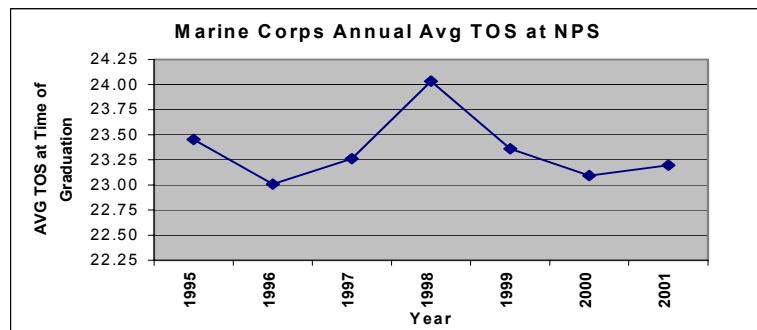


Figure 11. Average Time on Station - NPS Marine Corps Graduate

### 3. Degrees Awarded

The NPS Registrar's Office provided us with significant data concerning degrees awarded. Figure 12 provides the number of degrees awarded from NPS between the years 1995 and 2001. After 1995, the number of degrees awarded stabilized in a fairly narrow range between 758 and 682.

N P S D e g r e e s A w a r d e d							
	<u>1995</u>	<u>1996</u>	<u>1997</u>	<u>1998</u>	<u>1999</u>	<u>2000</u>	<u>2001</u>
Mar	197	163	192	153	136	131	152
June	204	179	169	157	175	252	219
Sept	237	225	195	199	208	173	175
Dec	239	191	182	199	163	176	N/A
<b>Awarded per Year</b>	<b>877</b>	<b>758</b>	<b>738</b>	<b>708</b>	<b>682</b>	<b>732</b>	<b>546</b>
							<b>720.1</b>

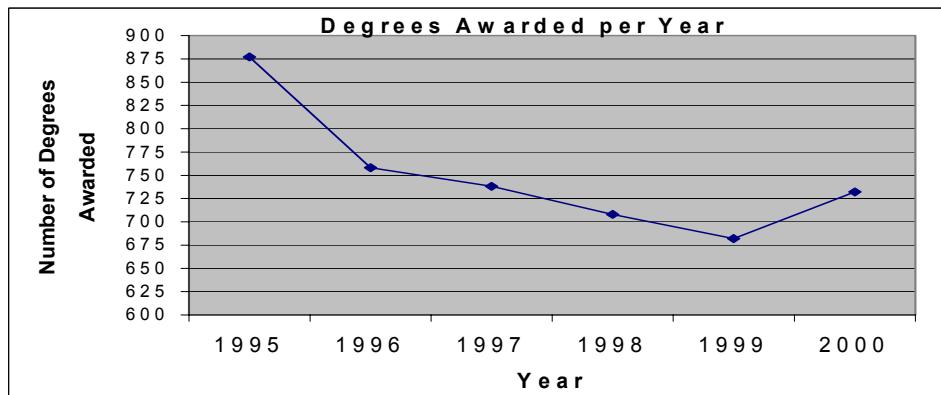


Figure 12. Quantity of NPS Degrees Awarded

#### 4. Promotion Rates of USMC NPS Graduates

In a *Marine Corps Gazette* article published in 1996 entitled, “Graduate Programs for the Future Marine Corps,” Major James E. Reilly, USMC, shows that Special Education Program (NPS) graduates generally have an overall higher promotion rate compared to their non-NPS peers. Reilly’s data spans five years from FY93 to FY97.

Promotion to Major			Promotion to Lt Colonel			Promotion to Colonel		
Year Group	NPS	Non-NPS	Year Group	NPS	Non-NPS	Year Group	NPS	Non-NPS
FY93	84.6	64.4	FY93	N/A	N/A	FY93	N/A	N/A
FY94	80.0	66.0	FY94	60.9	53.7	FY94	83.3	40.6
FY95	79.6	66.8	FY95	43.8	57.7	FY95	N/A	N/A
FY96	78.8	67.8	FY96	58.1	57.6	FY96	50.0	41.4
FY97	N/A	N/A	FY97	71.2	61.9	FY97	88.9	41.4

Table 2. Marine Corps Promotion Rates - NPS Vs Non-NPS

Data from the Marine Corps Manpower and Reserve Affairs (M&RA) web site for FY98 to FY02 shows a different trend. Non-SEP graduates generally have a better record at promotion boards than do SEP graduates. The Majors board contradicts this trend and is easily explained. Those Marines selected to NPS are predominately Captains who are screened prior to assignment to NPS. The Marine Corps only sends Marine Officers to NPS that have strong records and will most likely be promoted to the next higher grade. Once the Captains with NPS degrees become Majors, they compete against Majors who are not SEP graduates. The SEP majors may be less competitive than their non-SEP counterparts who have spent much more time in their MOSs in the operating forces. Only three of the last 10 years have SEP graduates performed better than their non-SEP peers across all three promotion boards.

FY 1998 COL BOARD	%SELECT	FY1998 LTCOL BOARD	%SELECT	FY1998 MAJ BOARD	%SELECT
SEP	39.10%	SEP	67.70%	SEP	91.10%
NON-SEP	42.80%	NON-SEP	68.30%	NON-SEP	76.60%
BOARD AVERAGE	42.40%	BOARD AVERAGE	68.20%	BOARD AVERAGE	78.50%
FY 1999 COL BOARD	%SELECT	FY1999 LTCOL BOARD	%SELECT	FY 1999 MAJ BOARD	%SELECT
SEP	50.00%	SEP	71.20%	SEP	91.50%
NON-SEP	41.80%	NON-SEP	65.90%	NON-SEP	79.30%
BOARD AVERAGE	43.10%	BOARD AVERAGE	66.80%	BOARD AVERAGE	80.90%
FY 2000 COL BOARD	%SELECT	FY 2000 LTCOL BOARD	%SELECT	FY 2000 MAJ BOARD	%SELECT
SEP	45.80%	SEP	65.40%	SEP	94.70%
NON-SEP	44.30%	NON-SEP	68.00%	NON-SEP	82.00%
BOARD AVERAGE	44.40%	BOARD AVERAGE	67.70%	BOARD AVERAGE	83.50%
FY 2001 COL BOARD	%SELECT	FY 2001 LTCOL BOARD	%SELECT	FY 2001 MAJ BOARD	%SELECT
SEP	31.00%	SEP	59.70%	SEP	98.50%
NON-SEP	49.40%	NON-SEP	65.30%	NON-SEP	83.00%
BOARD AVERAGE	46.70%	BOARD AVERAGE	64.30%	BOARD AVERAGE	85.00%
FY 2002 COL BOARD	%SELECT	FY 2002 LTCOL BOARD	%SELECT	FY 2002 MAJ BOARD	%SELECT
SEP	52.50%	SEP	68.10%	SEP	94.90%
NON-SEP	48.00%	NON-SEP	65.20%	NON-SEP	87.30%
BOARD AVERAGE	48.70%	BOARD AVERAGE	65.70%	BOARD AVERAGE	88.00%

Table 3.      Marine Corps Promotion Rates - NPS Vs Non- NPS FY 98-02

## 5.      Data Concerning the Impact of Graduate Education on Promotion

In this subsection, we present data concerning the Navy's support for graduate education and NPS. Furthermore, we present data concerning the impact of graduate education on officer promotion. Later, in Chapter V, we will analyze the data in this section to determine if the Navy's promotion practices are in alignment with its stated support of graduate education and possible implications in relation to DL .

### *a. Chief of Naval Operation's (CNO) Graduate Education Statement*

The following statement from the former Chief of Naval Operation's (CNO), Admiral Vern Clark, strongly supports graduate education and NPS in particular:

## CNO GRADUATE EDUCATION STATEMENT

The Naval Postgraduate School (NPS) remains a prominent symbol of the Navy's commitment to the personal and professional growth of its people.

As the world's most powerful and technologically advanced naval fighting force, we demand highly trained specialists and mature leaders. The rigorous educational programs offered by NPS help fulfill our need for specialists and provide students with a broadened perspective of global issues and the challenges that lie ahead.

Through the pursuit of a particular discipline, students expand their breadth of knowledge and hone their ability to successfully analyze and solve complex challenges. These skills foster fresh thinking and innovation and will help propel our Navy into the future.

The richly rewarding educational experience of the Naval Postgraduate School fortifies the intellect and aptitude of our Navy's future leaders and helps ensure that we remain the best Navy in the world.  
(Clark, 2000)

### *b. Precepts for Navy Officer Promotion*

Each year officer promotion boards are convened to consider those officers whom are "in zone" for promotion. Separate promotion boards convene for both line and staff officers and the various ranks. The Secretary of the Navy (SECNAV) issues each board an official precept. The precept specifies the total number of officers the board can select, defines the board's legal duties, and provides selection board guidance.

We reviewed the Secretary of Navy's precepts issued to LCDR, CDR, and CAPT promotion boards for FY01 and FY02. The precept includes an appendix entitled "Selection Standard and Skills Guidance." This appendix is very similar, but not exactly the same, for all types of officers and ranks. Each precept included guidance for the "Best-Qualified Standard" and "Graduate Education." The "Best-Qualified Standard" and "Graduate Education" guidelines from the precepts, of both LCDR Line Officer and LCDR Supply Officer selection boards, are provided below for comparison.

FY02 – Best-Qualified Standard, Line Officer, LCDR

The needs of the Navy dictate that our future leaders possess the qualities to excel in combat as commanders or in support of operational commanders. Proven excellence in operational environments and during arduous, demanding deployments is an important measure of the qualities required. Performance while in command, both at sea and ashore, as well as potential for major command, is the ultimate test of fitness for promotion. (SECNAV, 2001)

FY02 – Best-Qualified Standard, Supply Officer, LCDR

The needs of the Navy dictate that our future leaders possess the qualities to excel in combat as commanders or in support of operational commanders or positions of leadership in direct support of fleet operations. Proven excellence in operational environments is an important measure of the qualities required. Performance while in command (for those who have been afforded the opportunity), as well as potential for command, is the ultimate test of fitness for promotion. (SECNAV, 2001)

FY02 – Graduate Education, Line Officer and Supply Officer, LCDR (Precept guidance for graduate education is identical for both Line and Supply Officers promotion boards.)

Graduate education and specialty skills, represented by proven subspecialties, are important to our Navy and represent a key investment in our future. The Navy needs officers with formal technical military education in a time of increasing technological sophistication. Advanced education achievement is a significant career milestone in the development of future Navy leadership. The utilization of advanced education in subspecialty tours is an equally significant career milestone. In determining an officer's fitness for selection, you shall favorably consider graduate degrees, military education, and experience in specialized area. (SECNAV, 2001)

*c. Requirement to Advance Officers with Specific Experience*

The precept does not require a certain promotion rate for officers with graduate education. Alternatively, other standards and skills, put forth in the precept, require the board to promote officers, such as Acquisition Professionals (AP), who have special skills “at a rate not less than the rate for all line or staff officers in the same grade (SECNAV 2001).” Furthermore, with regard to officers who have served on Joint Staffs

or as Joint Subspecialty Officers, the precept requires that the board “strive to achieve...selection rates at least equal to selection rates for officers of the relevant competitive categories who are serving or have served at Navy Headquarters (SECNAV, 2001).”

***d. Promotion Rates of Naval Officers with Graduate Education vs No Graduate Education***

We were unable to obtain any line officer promotion data concerning the impact of graduate education upon promotions. Several inquiries were made to the Navy’s Bureau of Personnel and no one we contacted was able to produce or confirm the existence or availability of any historical data concerning graduate education in relation to line officer promotions. Although several officer detailers did speculate that, if anything, graduate education took line officers away from operational tours and put those officers with a graduate education at a disadvantage.

However, Navy Supply Corps detailers were able to provide partial data, Table 4, which includes the education level of Supply Officers promoted by a percentage of officers selected from the total amount of officers being considered, or “in-zone,” for promotion. Additionally, the Supply Corps’ data included the number of officers attending NPS at the time of promotion and how many of those students were promoted. Supply Officers, who were attending NPS at the time the promotion board met, were counted at a bachelor level of education. If NPS students were counted as having a master’s degree, the percentage of officers promoted with graduate degrees would have been higher in most cases. No Supply Officers eligible for promotion to Captain were attending NPS at the time the promotion boards met. The year group and its promotion level, along with level of education for Supply Officers promoted is provided below.

Promotion to LCDR				Promotion to Commander				Promotion to Captain		
Year Grp & % Sel	Mas	Bac	At NPS	Year Grp & % Sel	Mas	Bac	At NPS	Year Grp &	Mas	Bac
FY98 N/A	N/A	N/A	N/A	FY98 N/A	N/A	N/A	N/A	FY98 47.0	50	17
FY99 N/A	N/A	N/A	N/A	FY99 N/A	N/A	N/A	N/A	FY99 N/A	N/A	N/A
FY00 N/A	N/A	N/A	N/A	FY00 60.3	64.0	61.0	1 of 2	FY00 N/A	N/A	N/A
FY01 74.0	67.0	75.0	6 of 6	FY01 74.0	N/A	N/A	N/A	FY01 N/A	N/A	N/A
FY02 72.0	69.0	71.0	17 of 18	FY02 72.9	79.0	33.0	3 of 3	FY02 49.0	49.0	0.0

Table 4. Promotion Rates of Supply Corps Officers with Graduate Education vs. No Graduate Education

*e. Precepts for Marine Corps Officer Promotion*

We also examined the precepts for Marine Corps Officer Promotion Boards. A supplement to the precept gives guidance to the promotion board as the members select Marines to be promoted to the next higher grade. The supplement gives insight to what characteristics, career patterns, and level of professional military education the Marine Corps values.

Paragraph 4 of the precept supplement is titled, “Career Patterns.” It says,

The Marine Corps has not established an expected or preferred career pattern for officers of the Regular or Reserve component. In your deliberations you should consider that assignments are made in the best interests of the Marine Corps...You should also consider that the Marine Corps benefits when the officer corps possesses a broad spectrum of experiences...Assignments to the operating forces, recruiting duty...the special education program or the advanced degree program...all contribute to the depth and breadth of experiences that are critical to the Marine Corps...All assignments are important to the Marine Corps, and successful performance of assigned duties is the key in measuring an officer’s potential for promotion...(Marine Corps Precept, 2001)

The precept directs promotion boards to give the same weight to those billets outside the operating forces and a Marine’s normal MOS. Yet, the precept does not direct the promotion board to give preference to SEP graduates in the promotion process. Coming to NPS is not a favored career path; it is an acceptable career path. This paragraph may be viewed in full in Appendix B.

## **V. COST AND BENEFIT DATA ANALYSIS**

### **A. OVERVIEW**

As described in the Methodology chapter, Chapter V will predict the impact of the mandatory DL and MBA program policies on NPS enrollment. In order to examine the impact on enrollment, we will analyze the answers to the student survey, conduct a comprehensive application of Little's Law, and reason logically using critical data. Additionally, we analyze of promotion rates with respect to graduate education to provide insight into stakeholder values. Finally, we will discuss graduate education and the required service commitment. In each sub-section, we will examine stakeholders' costs and benefits. We briefly review costs, benefits, and stakeholders below.

#### **1. Costs**

In this chapter, we will discuss tangible, intangible, and opportunity costs, as well as transfer payments. Circular No. A-94, published by the OMB, states that a cost-benefit analysis (CBA) should identify both intangible and tangible costs. It should also identify opportunity costs. Opportunity costs are values placed on the inputs to implement a policy decision.

The opportunity cost of using an input to implement a policy is its value in its best alternative use. Opportunity cost measures what society must forgo to use the input to implement the policy. (Boardman, et.al, 2001)

A transfer payment is made when new benefits of one stakeholder is matched by an identical cost of another stakeholder. The Circular No. A-94 states that “transfers that arise as a result of the program or project being analyzed should be identified as such... and their distributional effects discussed.” We will identify transfer payments and discuss their distributional effects on stakeholders.

#### **2. Benefits**

A benefit is a gain resulting from a policy decision. Benefits, like costs, may also be tangible or intangible. Benefits are measured in what a person might be willing to pay

to obtain a given advantage or gain. Benefits are most easily measured in dollars, which may, or may not, adequately reflect the true value of a policy to society. In this thesis, we will measure benefits as “value-added” to the stakeholders.

### **3. Stakeholders**

Stakeholders are groups and individuals who can affect and be affected by implementing a policy. In Chapter III, we listed the parties that we considered to have standing in the outcomes of the DL and MBA policy decisions. Again, they are: individual officers, the Navy, the Marine Corps, the Navy Community Sponsors, and NPS.

We will assume that the faculty doesn’t have a significant bearing on enrollment at NPS. We believe the faculty will generally obey the wishes of the Superintendent regarding DL and the MBA. Should the faculty leave NPS in droves and be replaced by less capable instructors, some prospective students may choose not to attend NPS. We believe, however, that the faculty will remain.

Finally, this chapter will recognize the less organized, less vocal Naval Officer constituency. Boardman, et.al, suggests that less vocal constituencies are often better reflected in a CBA than in political machinations. A CBA takes into account the individually small, but in aggregate large, cost borne by less organized stakeholders.

## **B. SURVEY RESULTS AND ANALYSIS**

In this section, we will discuss the survey results. First, we will characterize the respondents. Next, we will discuss the survey responses regarding the DL and MBA programs. The survey will illustrate the possible effects of the future DL and MBA programs’ impact on NPS enrollment. Moreover, we will analyze the answers and show what impact, if any, the respondents’ characterization had on the survey results. Finally, our analysis will illustrate survey weaknesses. For a full table summary of survey results, see Appendix A.

### **1. Characterization of Respondents**

Seventy-three officers and government civilians answered our survey. Seventy percent of the respondents were Navy personnel and 26 percent were Marines. Over 93 percent of respondents were grades O-3 and O-4, while only two were Ensigns or O-1.

This has some implications, which we will discuss in the next section. We had three “other” respondents who were DoD civilian students. See table 5 below.

Nearly half of the respondents, or 47.1 percent, were Navy URL officers. Of the Navy URL respondents, 66.7 percent were Surface Warfare Officers, 17 percent were Aviation Maintenance Officers and 8 percent were Submarine Officers. Additionally, one NFO and one SEAL took the survey.

Of those Marine Officer respondents, 73.7 percent were ground Marines, 21 percent were helicopter pilots, and one respondent was a fixed-wing NFO. No fixed-wing Marine Corps pilots participated in the survey.

Fixed-wing pilots from both the Navy and Marine Corps were conspicuously absent from the pool of respondents. This did not surprise us, as it only confirmed our initial environmental observations. A few reasons might exist that explain the lack of fixed-wing pilots. One reason is that pilots may be drawn to more technical curriculums than are offered in the GSBPP. More likely, fixed-wing pilots and other URL officers pay the biggest price to come to NPS, as their occupational specialties demand the most training to maintain professional credibility in their communities. Fixed-wing pilots may be the group of potential students that are most inclined to stay in the fleet to maintain proficiency and remain competitive for promotion.

<b>Question 1</b> Service?	Navy <b>51</b> 69.86%	USMC <b>19</b> 26.03%	Other <b>3</b> 4.11%	Total <b>73</b>
<b>Question 2</b> Rank?	O-1 <b>2</b> 2.86%	O-2 <b>0</b>	O-3 <b>44</b> 62.86%	O-4 <b>24</b> 34.29%
<b>Question 3</b> URL?	URL <b>24</b> 47.06%	non-URL <b>27</b> 52.94%		<b>51</b>
<b>Question 4</b> If URL, what kind?	Fixed Wing <b>0</b>	SEAL <b>1</b> 4.17%	Av. Maint. <b>4</b> 16.67%	Rotary Wing <b>0</b>
	SWO <b>16</b> 66.67%	NFO <b>1</b> 4.17%	Subs <b>2</b> 8.33%	Other <b>0</b>
<b>Question 5</b> If USMC, what kind?	Not a pilot <b>14</b> 73.68%	Helicopters <b>4</b> 21.05%	Fixed-wing <b>1</b> 5.26%	<b>19</b>

Table 5. Survey Questions 1 through 5

## 2. Results and Analysis of DL Answers

Question 6 was our most telling question. We sought to determine how many students NPS would lose if DL courses were mandatory prior to resident study. Nearly 44 percent of the respondents stated that they would not have attended NPS if VTE/WBI were prerequisites. Fifty-six percent of the respondents would still have attended NPS. See table 6.

With regards to NPS enrollment, the results of this question were alarming. If the sample of students that took the survey is representative of the entire NPS student population, we can infer that NPS would lose 44 percent of today's enrollment. We examine the sample of respondents below.

We believe that, for some, the decision to come to NPS is risky and has significant opportunity costs. As data in Chapter IV showed, an NPS education does not guarantee and, in some communities, hampers promotion to O-5 and O-6. With officers being promoted at accelerated rates, officers have much less time and opportunity to depart from a standard career track. They must prove their worth to be promoted to Lieutenant Colonels and Commanders in less time than in the past. As we have discussed, coming to NPS takes officers out of pilothouses and cockpits, which may dull their fleet skills. Less significantly, there is a stigma in some communities for officers choosing to go to NPS rather than staying in the operating forces. In some small communities, an officer may carry this stigma from duty station to duty station.

Officers weigh the possible negative career effects of an NPS education with the many benefits NPS provides. Current resident students have already decided that an NPS education is worth the potential negative effects to their careers. These students have already weighed the benefits of an NPS tour against what may make them less competitive than their peers who have remained in the operating forces. Besides earning a top-notch degree, NPS allows a Sailor or Marine to escape from the fleet's excruciatingly high operational tempo to enjoy a higher quality of life. For some officers, these benefits, alone, are worth the risk. The officers we just described are among the sample of officers that responded to our survey. Current students have decided to risk coming to NPS despite potential harmful career effects. See Figure 13.

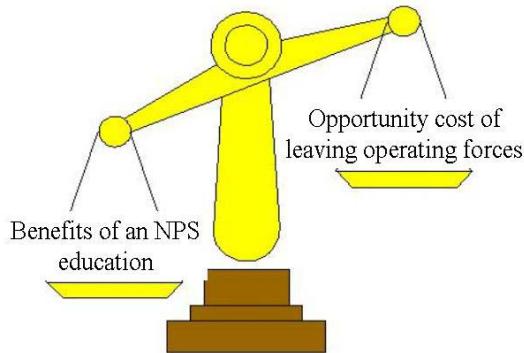


Figure 13. Student Perspective: Benefits of NPS Outweigh Opportunity Costs

Requiring prospective students to complete DL courses prior to resident study at NPS transfers the burden of the core and refresher courses to the student. This is a transfer payment of costs. The financial cost of an NPS degree decreases as resident time decreases. That reduction in financial cost, a benefit to NPS and the Navy, has corresponding costs to the student. In this case, the transfer payment generates more opportunity costs for the student.

The officers in the fleet that are working on DL courses after-hours could be spending time with their families, relaxing, playing softball, and enjoying a certain quality of life. If officers are working to complete DL courses while at another command, their attention is split between their courses, their primary duties, and their families. Do they have time to attend to all of their tasks? Can they do them all well? If not, their evaluation marks are in jeopardy because they are most likely being rated against officers who aren't NPS-bound and are focused on their primary duties. Piling more work on an already overburdened junior officer will tip the scales and dissuade officers from coming to NPS. See figure 14. Our survey results indicate that opportunity costs of the DL program would deter 44 percent of the *current* student body from attending NPS. As the existing NPS duration and configuration doesn't seem to be encouraging the current enrollment, increased opportunity costs will only dissuade prospective students further.



Figure 14. Student Perspective: Opportunity Cost plus DL Burden Outweigh Benefits of NPS

Although question 6 is the most important in our survey, it does have a weakness. We only surveyed students already enrolled as residents at NPS. For this question to be completely effective, we should have surveyed a sample of eligible officers out in the fleet. To get a complete view of the impact of changes in NPS policy regarding DL courses and the MBA program, we need to figure out the fleet officer's reaction. Will those officers out in the fleet, including pilots and SWOs, be drawn to NPS if they can get a degree in less than 18 months? Although the responses to question 6 show that NPS would lose a significant number of students already on campus, would NPS' gains be greater than its losses if NPS was more available to those seeking to get a degree in a shorter amount of time? Question 7 sheds some light into that possibility.

The response to question 7 suggests that NPS' gains may not outweigh its losses. Of the 73 respondents, 72.6 percent stated that they did not have time to complete VTE/WBI courses before, during, or after their regular workday at their last command. This percentage was much higher in the URL community. Of the URLs surveyed, 88.5 percent said that they didn't have time to complete DL courses on their own time. Of the SWOs surveyed, 93.75 percent stated that they, too, had no time to complete DL courses before, during, or after their regular workday. The only URL respondents to answer positively to this question were two aviation maintenance officers and one SWO. Every other URL answered negatively. The student feedback seems to suggest that potential students would not enroll in DL classes if DL classes were a prerequisite to attend NPS.

During our many interviews on campus, we were told that the DL program was not solely intended to shorten resident time on station. NPS would make Distance Learning available to the entire fleet for interested officers to educate themselves without

coming to NPS for resident study. Officers could take courses at their leisure to become better educated provided a command or other sponsor paid for delivering the courses. Question 8 of the survey provides insight on how officers in the fleet might take advantage of DL to simply learn and educate themselves. Given the ability to take NPS WBI/VTE courses, whether or not selected for resident study at NPS, 35.6 percent of respondents said that they would enroll in those courses *only if* they were selected to NPS. Fifteen percent said they would take advantage of DL courses *even if* they were *not* selected to attend NPS. Still, 49.3 percent stated that they had neither the time, nor the desire to take DL courses at their last duty station.

Question 9 examined whether or not a reduction in the payback period would motivate officers to complete DL courses at their previous duty station prior to resident study. Nearly 66 percent of respondents said that they would not have completed DL courses on their own time to reduce their required payback. Thirty-four percent would have completed DL courses to reduce the payback obligation. The low percentage interested in reducing their obligation after graduation is easily explained.

The students at NPS who took our survey were predominately mid-grade officers. Most mid-grade officers, whether O-3 or O-4, have generally decided to make military service their career. Since coming to NPS commits those officers to three or more years of service after graduation, they may very well serve to retirement. For instance, when a Marine Captain with eight years of service arrives at NPS to earn an 18-month degree, that Marine commits to 5.5 years of additional service. The officer will spend 1.5 years in school and another four years paying back the resulting obligation. After completing that commitment, the officer will be at the 13-year mark. With just seven years remaining until retirement, this officer is likely to maintain the course and retire from the service. Therefore, the officers polled were already willing to make a commitment. Question 9 is similar to question 6 in that we should ask officers who are currently serving in the fleet and, perhaps, undecided about and uncommitted to future service.

<b>Question 6</b> Still attend if DL Mandatory?	Yes <b>41</b> 56.16%	No <b>32</b> 43.84%	73	
<b>Question 7</b> Had time for DL?	Yes <b>20</b> 27.40%	No <b>53</b> 72.60%	73	
<b>Question 8</b> Take advantage of DL?	Yes, only if selected <b>26</b> 35.62%	Yes, even if not selected <b>11</b> 15.07%	No <b>36</b> 49.32%	73
<b>Question 9</b> DL for reduced payback?	Yes <b>25</b> 34.25%	No <b>48</b> 65.75%	73	

Table 6. Survey Question 6 through 9

### 3. Results and Analysis of MBA Answers

The survey included only two questions regarding the MBA program at NPS. Question 10 asked which of two degrees has most value to the respondent. Students that value the MBA over the MS measured 40.3 percent. Students that value the MS over the MBA measured 34.7 percent. Twenty-five percent of students surveyed stated that they were indifferent and value both degrees equally. The MBA program would satisfy 65 percent of all possible students, while the MS would satisfy 60 percent of all students. If NPS offered a MBA, we might conclude that more officers would be interested in pursuing graduate education.

We asked which degree the respondents' respective service/community valued more. The results were: 20 percent MBA and 48.57 percent MS. Thirty-one percent stated that their respective service/community valued both the MBA and MS degrees equally. The 31 percent consisted of primarily supply officers who felt that the Navy simply expected them to earn a graduate degree, regardless of kind. Although this question would be more valuable had it been asked to community sponsors, the responses do suggest that the switch from an MS to an MBA might not satisfy most community leaders.

<b>Question 10</b> Which has more value to you?	MBA <b>29</b> 40.28%	MS <b>25</b> 34.72%	Either <b>18</b> 25.00%	<b>72</b>
<b>Question 11</b> Value to your service?	MBA <b>14</b> 20.00%	MS <b>34</b> 48.57%	Either <b>22</b> 31.43%	<b>70</b>

Table 7. Survey Questions 10 and 11

## C. APPLICATION OF LITTLE'S LAW TO REDUCED TIME ON STATION

In this section, we will apply and interpret the application of Little's Law to reducing student time on station or cycle-time at NPS.

Some decision makers cite time away from fleet and the cost of officers' salaries as the major impediments to increasing resident enrollment at NPS or to any civilian postgraduate education program. Leadership, in some officer communities, at program sponsors, and at NPS, believes one solution is to reduce time in residence. Reducing program time or, in the terms of Little's Law, cycle-time will reduce the number of officers at NPS. DL may not be the answer to increasing enrollment at NPS nor increasing the number of officers with advanced degrees.

We must be careful not to conclude that reduced program time will allow the Navy to increase the number of officers with degrees, increase enrollment, and at the same time reduce salary expense and time away from the fleet by the same amount. If average time on station is reduced from 22.8 months to 18 months (approximately a 21 percent reduction), than according to Little's Law we can expect the average number of students onboard to decrease 21 percent. The number of degrees awarded each quarter would remain the same.

### 1. Reducing Time on Station/Cycle-Time and Enrollment/Inventory

If we use DL to reduce an 18-month resident program's time on station or cycle time to by 33 percent to 12-months, Little's Law holds that in-resident enrollment (inventory) will immediately decrease by 33 percent and number of officers receiving degrees (throughput) will remain the same as before the cut in cycle-time, see figure 15. The Navy would save 33 percent of current salary expense or time away from the fleet and still get same amount of graduate-educated officers.

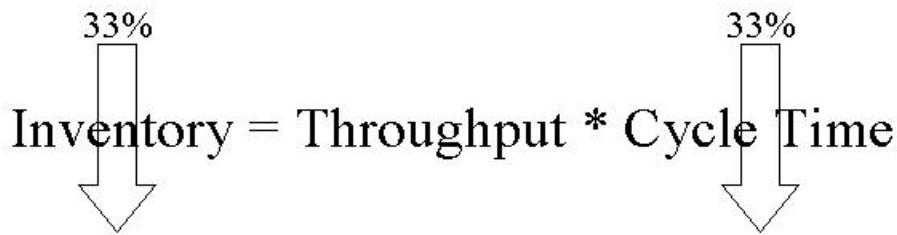


Figure 15. Reducing Cycle Time Reduces Inventory

Notes: The Navy would still have to pay the salaries of officers no matter where the students were located. Also, we realize a 33 percent education in cycle-time is very steep, however, if, in theory, all refresher courses, core courses, and thesis requirements were eliminated from an 18-month program it may be possible. However, we do not endorse such a reduction in program time. The 33 percent reduction is helpful for illustrating the problem and providing reader with the impact that a reduction in cycle-time has on enrollment.

For example, Figure 16 (Plan 1) shows that if time on station is reduced from 18 months to 12 months, community leaders could choose to reduce the average number of officers attending NPS by one-third. Sponsors would save 33 percent in officer salary expense or officer time away from the fleet, while maintaining the same number of officers receiving post-graduate degrees. NPS in-resident enrollment would drop by 33 percent or by 300 students, if there were an average of 900 students onboard.

In Figures 16 and 18, each arrow represents 300 officers. Quantities shown are for illustration purposes only. The top portions of Figures 16 and 18 illustrate inventory (enrollment), throughput (degrees awarded), and cycle-time (time on station) for an 18-month program, while the lower portion illustrates the same elements of a 12-month program.

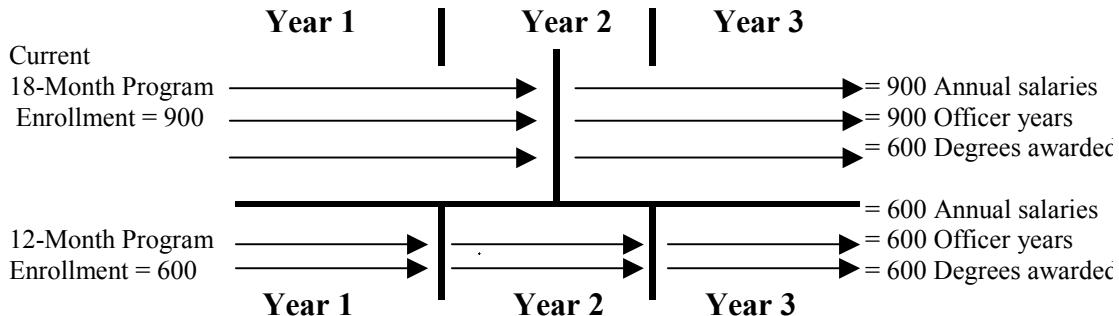


Figure 16. Plan 1 Saving of Time and Salaries

Figure 17 is a graph of the percentage of savings achieved by reducing time on station or cycle-time. When cycle-time is reduced by one-third, there is 33 percent reduction in enrollment or inventory. With a 33 percent reduction in cycle-time, the Navy immediately realizes a savings of 33 percent in officer salaries or officer time away from the fleet. However, if the Navy prefers to save less and chooses to increase the number of officers with degrees, the percentage of savings will steadily decrease in direct proportion to the increase in number of degrees awarded. The Navy's savings will be zero, if it prefers to keep enrollment at the same level as before the reduction in cycle-time.

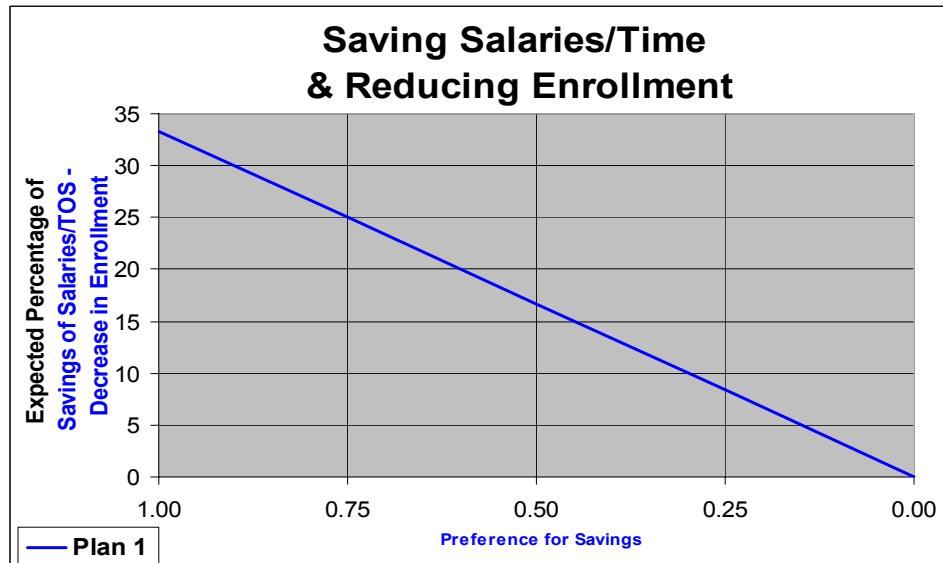


Figure 17. Plan 1 - Graph of Expected Savings in Salaries/Time & Decrease in Enrollment

## 2. Reducing Time on Station/Cycle-Time and Increasing Degrees Awarded/Throughput

As the number of officers receiving graduate degrees increases, the initial 33 percent in savings in salaries will decrease. Figure 18 (Plan 2) shows if community leaders choose to maintain the current enrollment level at NPS, then they forgo all savings in salaries and officers' time away from the fleet. However, the number of officers receiving degrees would increase by 50 percent. NPS in-resident enrollment would remain the same.

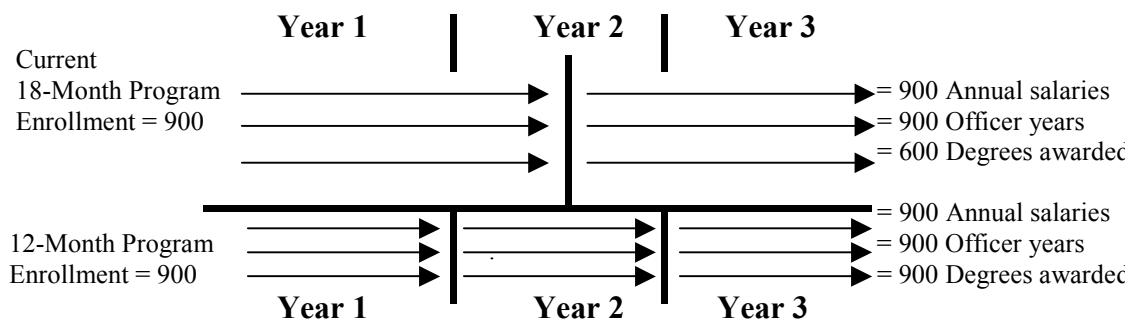


Figure 18. Plan 2 Increase in Degrees

Figure 19 graphs the percentage increase of degrees awarded achieved by reducing time on station or cycle time, as the preference for more officers with graduate education increases. With a 33 percent reduction in cycle-time, the Navy initially realizes no increase in the number of officers with degrees. However, if the Navy prefers to save less and chooses to increase the number of officers with degrees, the percentage of degrees awarded will steadily increase.

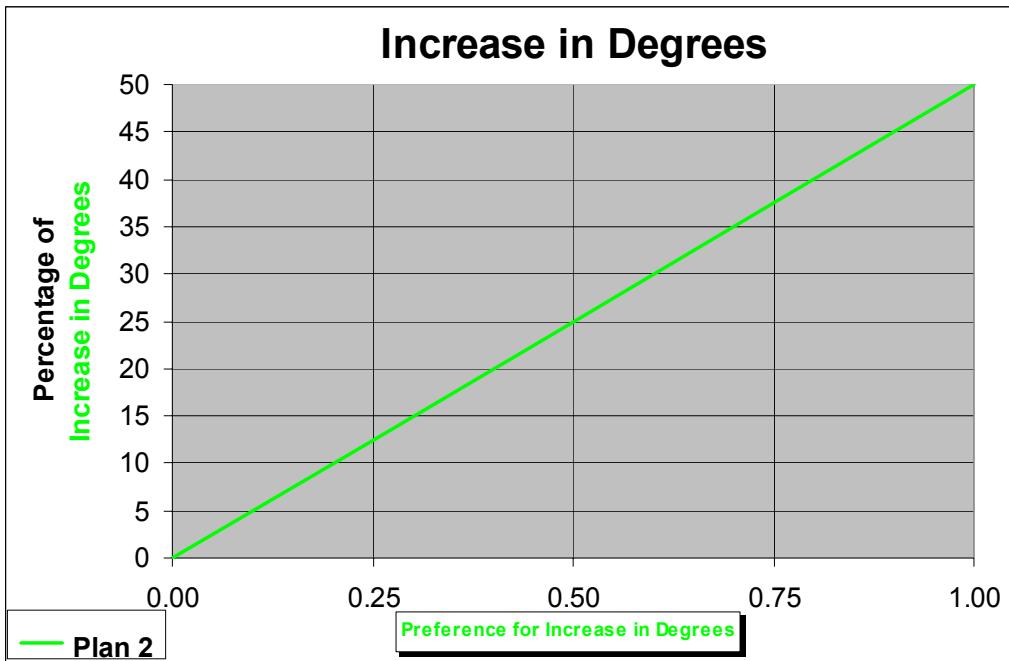


Figure 19. Plan 2 – Graph of Preferences for Increasing Degrees

### 3. Compromise Plan: Reducing Cycle-Time and Decreasing Enrollment while Increasing Degrees Awarded

Table 8 summarizes the benefits of each plan at the extreme preferences. Plan 1 - take all the savings in salaries or time. Plan 2 – take the savings in additional degrees. Regardless of the preference chosen, in-resident enrollment at NPS will not increase until the additional number of degrees awarded each quarter is greater than 75, a 50 percent increase. See table 9 below. When Little's Law is applied to our model 18-month program, Plan 1, and Plan 2, we can expect the following results:

$$\begin{aligned}
 \text{Enrollment} &= \text{Degrees Awarded (Per quarter)} * \text{Length of Program (In quarters)} \\
 \text{18-Month: } 900 &= 150 * 6.0 \quad \text{Plan 1: } 600 = 150 * 4 \quad \text{Plan 2: } 900 = 225 * 4
 \end{aligned}$$

	<b>Plan 1</b>	<b>Plan 2</b>
<b>Salary</b>	Reduced by 1/3	Constant
<b>Officer Time</b>	Reduced by 1/3	Constant
<b>Degrees</b>	Constant	Increased by 1/2
<b>Enrollment</b>	Reduced by 1/3	Constant

Table 8. Summary of Plans 1 & 2

Alternatively, leaders may choose somewhere between both plans. As the preference to increase the number of officers with graduate degrees (throughput) goes up, the number of officers enrolled (inventory) must increase and initial savings realized from cycle-time reduction must decrease in order to keep the equation balanced. Remember, from Little's Law,  $INV = TP * CT$ . Each time one side of the equation changes, the other side must also change. With a 33 percent reduction in cycle-time, the Navy initially realizes no increase in the number of officers with degrees and a 33 percent increase in salary/time savings along with a 33 percent reduction in enrollment. However, if the Navy prefers to save less than the initial 33 percent provided from a 33 percent cycle-time reduction, than the Navy must prefer to increase the number of officers with degrees. The percentage of degrees awarded will increase while the percentage of savings will decrease in relation to the increase in degrees.

Both Table 9 and its associated graph in Figure 20 provide decision makers with a tool to determine how much savings in salaries/time (i.e. decrease in enrollment) and increase in degrees awarded can be expected when program time (cycle-time) is cut 33 percent. Table 9 and Figure 20 provide the outcomes of the combinations of both Plans 1 and 2. Located on the X-axis of the graph in Figure 20 is the preference weight of leaders for; Plan 1 take savings in time/salaries and Plan 2 increase the number of officers with graduate degrees (throughput). The Y-axis indicates the expected percentage increase of graduate-degrees awarded and the expected percentage decrease to enrollment along with the time/salary savings realized due to a reduction of cycle-time.

Table 9 below provides combinations of the results that can be expected from a 33 percent reduction in cycle-time/time on station.

<b>Possible Outcomes of 33% Cycle-Time (TOS) Reduction</b>							
<b>Qty Decr of Enroll</b>	<b>% Decrease of Inventory</b>	<b>INV Officers</b>	<b>= CT TOS</b>	<b>* Throughput Degrees</b>	<b>Per Quarter in Throughput</b>	<b>Per Quarter % Increase</b>	<b>Per Quarter Qty Increase in Degrees</b>
-300	-33.33%	600	= 4	* 150.00	0.00%	0	
-275	-30.56%	625	= 4	* 156.25	4.17%	6	
-250	-27.78%	650	= 4	* 162.50	8.33%	13	
-225	-25.00%	675	= 4	* 168.75	12.50%	19	
-200	-22.22%	700	= 4	* 175.00	16.67%	25	
-180	<b>-20.00%</b>	<b>720</b>	<b>= 4</b>	<b>* 180.00</b>	<b>20.00%</b>	<b>30</b>	
-175	-19.44%	725	= 4	* 181.25	20.83%	31	
-150	-16.67%	750	= 4	* 187.50	25.00%	38	
-125	-13.89%	775	= 4	* 193.75	29.17%	44	
-100	-11.11%	800	= 4	* 200.00	33.33%	50	
-75	-8.33%	825	= 4	* 206.25	37.50%	56	
-50	-5.56%	850	= 4	* 212.50	41.67%	63	
-25	-2.78%	875	= 4	* 218.75	45.83%	69	
0	0.00%	900	= 4	* 225.00	50.00%	75	
Beginning Inventory = 900							
Beginning Throughput = 150 per quarter							
Beginning Cycle Time = 6 quarters							

Table 9. Outcomes expected from a 33% Reduction in Cycle-Time

Leaders preferences for Plan 1 (save salaries/time and reduced enrollment) and Plan 2 (degrees) are inverse and must equal 1.0. If leaders prefer more degrees than they save less, or if they want more savings than they get less degrees. To use the graph in Figure 18, first estimate what weighting of Plan 1 or Plan 2 community leaders prefer. If leaders have a .25 preference weighting for Plan 1 than they must have a .75 preference for plan 2. Salary/time savings is 8 percent; enrollment will decrease 8 percent, while degrees received will increase 37.5 percent. At the intersection of the two lines, a .6 weighting of Plan 1 and .4 weighting of Plan 2 would result in a 20 percent reduction in salary expense/enrollment and a 20 percent increase in the number of degrees awarded. Therefore, to use the graph below, leaders only need to know one preference (for savings or more degrees) in order to deduce the expected decrease to enrollment (inventory) and increase in degrees awarded (throughput) after a 33 percent cut in time on station (cycle time).

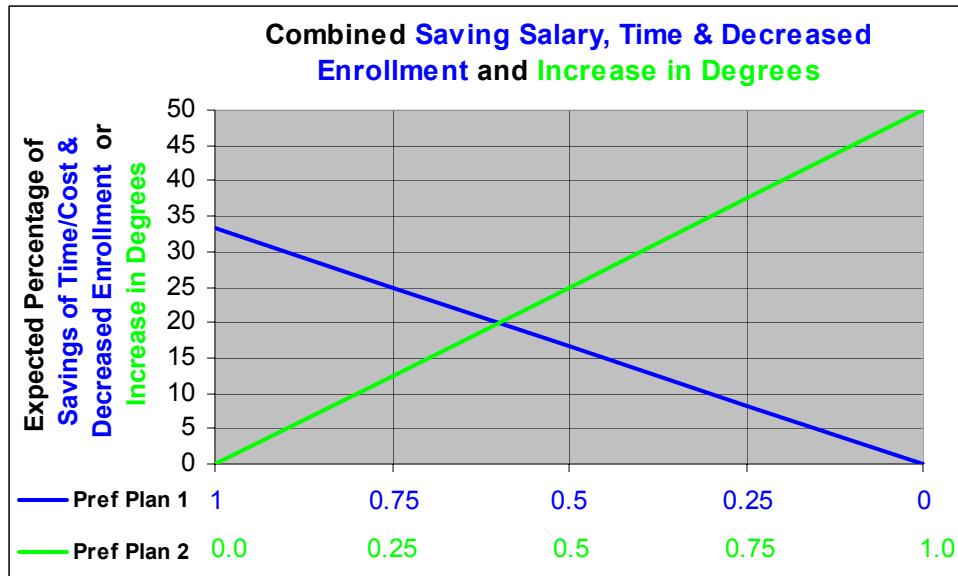


Figure 20. Graph of Expected Results from a Combination of Plans 1 & 2

#### 4. NPS Assessment of Sponsors

NPS should be able to make a rough assessment of URL community leaders' preferences for more officers with graduate education experience or for saving salaries/hours away from the fleet. NPS should assess these preferences and use the tools provided above in Table 9 and Figure 18 prior to going forward with the reduction of program time. NPS could then design their organization to deliver education according to the customer's demand. Currently, the community leaders preferences are unclear.

In the current environment, both dollars and manpower are extremely scarce. Community leaders could rationally choose to take the savings in manpower/salaries, cut enrollment, and maintain the status quo in officers with graduate education. Recently the SWO community began paying large bonuses to retain the officers they have now. It is quite possible that the SWO community will use the savings in time on station to increase shipboard manning and reduce the average number of officers attending NPS. Curriculum sponsors and community leaders will readily embrace a reduction program time. In fact, DL would save sponsors many dollars at the expense of already overworked ship-based junior officers.

## 5. The Cost and Benefits of Reducing Cycle-Time

The above application of Little Law's shows that the Navy and Marine Corps organizations, as well as the students' respective sponsors, would reap enormous benefits in the form of student salaries. The Navy, Marine Corps, and the sponsors could use reduction in cycle-time to fill other jobs in the Navy, which would we would classify as student opportunity costs. The prospective student would pay for the benefits that the Navy, Marine Corps, and sponsors receive. Furthermore, our model of Little's Law shows that NPS may benefit with higher throughput (award more degrees), however, NPS would probably realize a significant reduction in resident enrollment.

To reduce time on station, a 12 or 15-month program would require officers to complete most refresher and core courses before entering NPS. Any significant reduction in cycle-time may actually reduce enrollment and have many hidden costs for all the stakeholders. This plan would unintentionally disqualify those hard-working, dedicated officers who don't find the time to complete the core and basic courses during their time at sea. If NPS is only offering a 12 or 15-month master's in-resident degree program, NPS couldn't even consider accepting officers who don't complete core and basic courses. This would reduce the eligible recruiting pool significantly. Additionally, since most of our sharpest officers have the hardest and most time consuming jobs in the fleet, this course of action may have a negative impact on the quality of student NPS receives.

The solution to NPS' decline in enrollment is not making already overworked junior officers work even harder. Currently, WBI/VTE is not a feasible option for a majority of ship-based, deployed junior officers. Officers stationed on ships may not be able to participate in distance learning simply because they don't have the time. DL/WBI will face stiff competition from other junior officer responsibilities, such as watch qualifications, warfare qualifications, engineering qualifications, watch standing and divisional duties, as well as several other collateral duties. Officers would certainly have to weigh the opportunity costs of shipboard duties against mandatory DL.

Additionally, there just aren't that many "smart ships" in the fleet to support WBI/VTE. Many officers, just returning from operational tours in the fleet, reported that ships only had access to the Internet when deployed. Even then, the satellite connection was not reliable and slow. One officer stated that after returning from a recent deployment, the fleet commander disconnected Internet connectivity citing prohibitive costs. However, upgrades and technological improvements may some day make ship-

based WBI/VTE practicable. Presently, based upon recent shipboard experience from both Navy and Marine Corps officers, the Navy's ships cannot adequately support WBI/VTE. Aircraft carriers may be the exception. Carriers have resources available and are a place where NPS could target the aviation community who is significantly underrepresented at NPS.

The Navy must consider the cost of outfitting "smart" ships and shore installations to support VTE/WBI courses, and NPS would have to consider the cost of its own DL infrastructure. For DL to be successful, NPS would have to consider its organizational design in terms of product delivery. NPS' organization would have to expand and transform to support DL and at the same time contract to meet reduced resident enrollment due to the cycle-time reductions as a result of DL. However, as VTE/WBI course completion rates are generally low, are these investments worth the expected returns?

Eliminating or replacing core and refresher courses with mandatory DL in order to reduce cycle-time may have other hidden costs. After all, refresher and core courses are as their names imply; a refresher course is given to "refresh" basic knowledge and to bring the student up to date, while core courses are basic classes needed for the foundation of the master's program. For many Navy students, who have not attended classes in several years, the first quarter of classes are crucial to their successful integration back into the classroom, especially when crossing over to a new discipline.

If a 12 or 15-month program were adopted, NPS would have to seriously consider some type of modification to the current requirement for a thesis. The MBA program, due for implementation in January 2002, does eliminate the thesis requirement and replaces it with group projects. The thesis provided an output, which is a benefit that NPS provides to sponsors, the Navy, and the Marine Corps. However, group projects may serve the same purpose.

## **D. ANALYSIS OF PROMOTION AND GRADUATE EDUCATION**

### **1. USMC NPS Grads Promotion Rates**

Data in Chapter IV shows that an NPS education is not a guarantee for promotion through the ranks, nor does an NPS degree give a Marine an advantage for promotion to grades O-5 and O-6. In fact, promotion rates of non-SEP graduates have been greater

than those of SEP graduates in the last three of five years. This illustrates the opportunity cost discussed in the survey portion of this chapter. Should a Marine go to NPS or should he stay in the fleet to gain operational experience? Which course of action makes him more competitive for promotion?

## **2. Analysis of the Relationship of Officer Postgraduate Education and Promotion, and Some Possible Effects upon Distance Learning**

If the Navy significantly values officer graduate education, we should expect higher promotion rates for officers with graduate education than those without a graduate education. Both the CNO's vision statement and the SECNAV's precept guidance regarding graduate education suggest strong institutional support for officer graduate education. However, the data that we obtained, or its absence, seems to indicate otherwise.

### ***a. Analysis of Precepts and Lack of Graduate Education Data***

The SECNAV's promotion precept guidance concerning "Best-Qualified Standard" and Graduate Education seem to be in conflict with each other. First, the precept regarding the application of the statutory best-qualified standard specifically states, "Proven excellence in operational environments is an important measure of the qualities required [for promotion] (SECNAV, 2001)."

While later, the precept states, "In determining an officer's fitness for selection, you shall favorably consider graduate degrees, military education, and experience in specialized areas (SECNAV, 2001)."

While we are not suggesting that excellence in performance in an operational environment and graduate education are mutually exclusive, we do believe there is valid concern and perception that the board may place greater weight on operational experience than on educational achievement. Nor are we suggesting that it is wrong to value operational experience above educational experience. The perception, whether valid or not, will undoubtedly steer career oriented officers to operational commands rather than taking time out to pursue a masters degree at a training command such as NPS. However, the same perception may also make career oriented officers more inclined to take DL courses in order to reduce time away from operational duty. On the other hand, an officer, who is unable to take DL courses due to high operational tempo or

unavailability, may be put at a disadvantage not only during promotion but also when being considered for selection to a postgraduate education program.

The absence of readily available data concerning the relationship between graduate education and promotion indicates that no special emphasis is accorded graduate education during the promotion process for a majority of officer communities. Furthermore, by not requiring promotion boards to promote graduate educated officers at a rate higher than or equal to the overall selection rate in the relevant competitive category, does seem to suggest that graduate education is not as critical as other standards and skills such as Joint Duty or qualification as an Acquisition Professional.

Because of the lack of perceived importance which some promotion boards and community leaders seemingly place on graduate education for promotion, graduate education will remain a low priority for officers who desire promotion and career growth within the Navy. If Navy leadership does not show a commitment to graduate education through higher promotion rates, then enrollment in graduate education programs will remain depressed. However, DL may enable more operational oriented officer communities to obtain graduate education. The career oriented officer may be more inclined to take DL classes in order to increase his operational experience and reduce time spent at NPS. Decision makers, who are not fully committed to graduate education as evidenced by promotion rates of NPS graduates, may take any benefits realized from reduced cycle-time (TOS) in the form of dollars and manpower rather than increase officers with graduate degrees.

***b. Analysis of Graduate Education and Promotion of Navy Supply Corps Officers***

The Navy's Supply Corps is rewarding graduate educated officers with higher promotion rates than those officers without a master's degree; see Table 4 in Chapter IV. Although the promotion statistics from the Navy's Supply Corps are not large, we can infer the impact that graduate education is having on Supply Corps promotions. The promotion statistics available for the Supply Corps indicate that all senior officers must have a master's degree in order to have a genuine chance at promotion. For instance, in FY02 every Supply Officer selected for Captain held a masters degree.

Additionally, the FY00 Supply Corps' CDR eligible promotion zone had 110 LCDRs with master's degrees and 119 LCDRs with bachelor degrees. The FY00 CDR selection rate for officers with master and bachelor degrees was almost even. However, the FY02 CDR eligible promotion zone had 117 LCDRs with master's degrees and only 15 officers without a master's degree. Supply Officers, in the FY02 CDR year group with master's degrees, were promoted at a substantially higher rate than those officers who only held undergraduate degrees.

Both Supply Officers and the Navy's Supply Corps receive benefits from the Supply Corps' education strategy. Supply Officers with graduate education are promoted at higher rate than those without a graduate degree. The Supply Corps receives a highly educated corps upon which the Supply Corps can build its future.

#### **E. COST OF A GRADUATE EDUCATION IN TERMS OF OFFICER REQUIRED SERVICE COMMITMENT**

In return for the benefit of free graduate education, one cost for an NPS graduate is a commitment of service after starting the graduate education program. In return for providing an education, the Navy and sponsors obtain a future service commitment from their officers. For Naval officers, the service commitment is a period of three times the length of education through the first year. After the first year, the officer is required to payback one additional month of duty for every month in attendance at NPS (CNO, 1991). The longer an officer stays at NPS, the longer his/her after graduation commitment becomes. For example, if an officer attends NPS for an 18-month period, the officer is required to serve 3.5 years after graduation; three years payback for the first 12 months at NPS and six months for the last six months at NPS. An officer who only spends 12 months at NPS would payback three years.

From earlier discussions, we have established that one of the main purposes of DL is to reduce officer time on station. From the application of Little's Law, we have established that shorter time on station (Cycle-Time) would reduce cost in terms of salary expense and time on station, and that we can increase the number of degrees awarded. However, the longer the officer stays at NPS, the payback gets shorter relative to his length of tour at NPS. No benefit is provided to officers who are able to finish their studies earlier than the rest of the class. In fact, the current payback system seems to reward officers who stay at NPS the longest.

Table 10 provides the required payback time and total commitment for the respective time spent in a graduate education program. Table 10 also includes a column entitled “payback multiplier.” The multiplier is applied to an officer’s time spent at NPS and its product is the required payback time. While payback time does increase with each additional month the officer spends at NPS, the payback multiplier continues to decrease. The current payback policy is regressive and does not encourage students to finish their studies as early as possible. In fact, the current policy may encourage students to stay at NPS longer than required. Additionally, the current payback policy does not encourage officers to complete courses prior to arriving at NPS. In short, the Navy is rewarding A and expecting B.

If the Navy, sponsors, and NPS want to reduce the amount of time, officers spend at NPS or in any graduate program and encourage DL, than the Navy and DoD may have to reexamine the current regulations governing officer commitment for graduate education. The Navy and DoD could revise the payback formula to make it less regressive. To reduce cycle time and encourage students to return to the fleet or to any other job the Navy needs filled, the Navy could aggressively reduce the payback for students who graduate in a year or less. Alternatively, if Navy leadership finds a reduction in payback time is unacceptable, the Navy could provide early graduates with preferential treatment in the detailing process for their next duty station after NPS. In fact, the Navy could provide early detail to students, who require minimal TOS (i.e. three quarters or less). Detailers could provide these officers with orders to their payback tour prior to reporting to NPS. Finally, the Navy could moderately increase the payback time for students who remain in graduate studies greater than the average student.

<b>Time in School</b>		<b>Payback</b>	<b>Required Payback Time</b>	<b>** Total Commitment</b>		
<b>Years - Months</b>	<b>Years</b>	<b>Multiplier</b>	<b>Years - Months</b>	<b>*Years</b>	<b>Years - Months</b>	<b>Years</b>
1 - 0	1.00	<b>3.00</b>	3 - 0	3.00	4 - 0	4.00
1 - 1	1.08	<b>2.84</b>	3 - 1	3.08	4 - 2	4.16
1 - 2	1.17	<b>2.72</b>	3 - 2	3.17	4 - 4	4.34
1 - 3	1.25	<b>2.60</b>	3 - 3	3.25	4 - 6	4.50
1 - 4	1.33	<b>2.50</b>	3 - 4	3.33	4 - 8	4.66
1 - 5	1.42	<b>2.41</b>	3 - 5	3.42	4 - 10	4.84
1 - 6	1.50	<b>2.33</b>	3 - 6	3.50	5 - 0	5.00
1 - 7	1.58	<b>2.26</b>	3 - 7	3.58	5 - 2	5.16
1 - 8	1.67	<b>2.20</b>	3 - 8	3.67	5 - 4	5.34
1 - 9	1.75	<b>2.14</b>	3 - 9	3.75	5 - 6	5.50
1 - 10	1.83	<b>2.09</b>	3 - 10	3.83	5 - 8	5.66
1 - 11	1.92	<b>2.05</b>	3 - 11	3.92	5 - 10	5.84
2 - 0	2.00	<b>2.00</b>	4 - 0	4.00	6 - 0	6.00
2 - 1	2.08	<b>1.96</b>	4 - 1	4.08	6 - 2	6.17
2 - 2	2.17	<b>1.92</b>	4 - 2	4.17	6 - 4	6.33
2 - 3	2.25	<b>1.89</b>	4 - 3	4.25	6 - 6	6.50
2 - 4	2.33	<b>1.86</b>	4 - 4	4.33	6 - 8	6.67
2 - 5	2.42	<b>1.83</b>	4 - 5	4.42	6 - 10	6.83
2 - 6	2.50	<b>1.80</b>	4 - 6	4.50	7 - 0	7.00
2 - 7	2.58	<b>1.77</b>	4 - 7	4.58	7 - 2	7.17
2 - 8	2.67	<b>1.75</b>	4 - 8	4.67	7 - 4	7.33
2 - 9	2.75	<b>1.73</b>	4 - 9	4.75	7 - 6	7.50
2 - 10	2.83	<b>1.71</b>	4 - 10	4.83	7 - 8	7.67
2 - 11	2.92	<b>1.69</b>	4 - 11	4.92	7 - 10	7.83
3 - 0	3.00	<b>1.67</b>	5 - 0	5.00	8 - 0	8.00

\* Years in school \* Payback Multiplier = Required Payback Time

\*\* Time in school + Required Payback = Total Commitment

Table 10. Navy Officer Time in School, Payback, & Total Commitment

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## **VI. CONCLUSIONS AND RECOMMENDATIONS**

### **A. OVERVIEW**

In Chapter VI, we provide a short summary of our thesis. Second, we present conclusions from our research regarding implementing Distributed Learning and the Masters of Business Administration programs. Finally, we make recommendations to increase NPS enrollment and the number of officers with graduate degrees.

### **B. SUMMARY**

The goal of our thesis was to determine what impact a reduction of officer time on station (TOS) at NPS would have on curriculum sponsors, students, NPS, the Navy, and the Marine Corps. The second goal of the thesis was to provide NPS leadership with a viable course of action to increase student enrollment while providing for a quality education.

First, we discussed the current environment and background, which revealed a decline in both officer end-strength and enrollment at NPS. To increase enrollment and NPS' availability to the fleet, NPS is implementing Distributive Learning (DL). NPS is considering using a combination of Web Based Instruction and Videoteleeducation to eliminate core and refresher courses in order to reduce officer TOS. Finally, to respond to current trends in graduate education, NPS is replacing its Masters of Science in Management program with an MBA program.

Second, we reviewed several published works which discussed some aspect of NPS or problem solving technique that we felt were significant in our examination of the costs and benefits of NPS' DL and MBA programs. Third, we provided our methodology: a survey, a thorough application and analysis of Little's Law, and an analysis of critical data.

During our research, we conducted several interviews which confirmed that one major driver behind DL was to reduce officer time spent at NPS. Reducing TOS would reduce costs (officer salaries) and possibly increase enrollment since an NPS education would be less expensive and more widely available. We reviewed NPS enrollment in detail between 1995 and 2001. Overall, enrollment data revealed a moderate declining

trend, which has recently stabilized at approximately 1,280 students. However, the enrollment of Surface Warfare Officers (SWO) and Naval Aviators has decreased significantly in the past five years and shows no signs of stopping. Other enrollment data shows that TOS for Navy and Marine Corps officers has remained in a narrow range of 23 to 25 months with a slightly declining trend over the last six years. We further reviewed officer promotion board precepts and the CNO's vision of technically trained, mature, and graduate educated officers to lead the world's most powerful and technologically advanced naval fighting force.

We conducted Cost/Benefit Analysis of the problem using several different tools. We used Little's Law to consider the impact that a reduction in TOS would have on resident enrollment. Our model, which reduced TOS or cycle-time from 18 to 12 months, revealed that enrollment would fall dramatically unless the Navy and sponsors have a need for more officers with graduate education. In fact, even if the Navy doubled its annual quota for officers with graduate degrees, enrollment could remain the same with a 33 percent reduction in TOS/cycle-time. The savings in the form of officers' salaries/time would be 33 percent, as well. Throughput (NPS graduate degrees awarded), however, could be increased in exchange for a reduction in officer salary/time savings.

We also conducted an in-depth student survey, which found that almost 45 percent of the students currently enrolled at NPS would not have enrolled had DL courses been prerequisites for their resident study. Furthermore, 73 percent of the respondents stated that they did not have time to complete DL courses at their last duty station, regardless of the requirement for DL. This data indicated that NPS enrollment may decrease based on student opinion alone should DL courses become mandatory.

Our analysis of Marine Corps promotion and graduate education revealed that a master's degree is a liability when it comes to promotion to Lieutenant Colonel and Colonel. The promotion data for the Navy's Surface Warfare and Aviation communities was not readily available, which could imply that graduate education is not a significant driver of those communities' promotion boards. On the other hand, the Navy Supply Corps rewards its graduate educated officers with higher rates of promotion to Commander and Captain.

We examined the cost of a graduate education in terms of officer required service commitment. The service commitment is regressive. The required payback commitment does not encourage or reward officers to embrace distance learning or to reduce their time spent at NPS.

## C. CONCLUSIONS

The following are specific conclusions drawn from this study:

- 1. A Reduction of Student Time on Station (TOS) through Distributed Learning (DL) will Reduce NPS Resident Enrollment and May Reduce the Quality of the Perspective NPS Student**

A reduction in TOS or cycle-time through a vigorous execution of DL will not lead to an increase of enrollment at NPS, specifically in those officer communities - Surface Warfare Officer (SWO) and Aviation - which NPS hopes to attract. In fact, an aggressive implementation of DL, which allows NPS to eliminate core and refresher courses from its in-resident graduate program, could decrease the quality of resident student. DL may inadvertently eliminate the most dedicated and sharpest officers in the fleet who will not have the time to complete DL courses prior to arrival at NPS.

- 2. DL Does Provide Significant Benefits to All Stakeholders Except Officers**

A reduction in TOS through DL does promise significant benefits to key stakeholders. A reduction in cycle-time will allow NPS to increase its throughput or the quantity of master's degrees that it confers each quarter. DL may also allow NPS to expand its customer base. Decreased officer TOS will reduce the cost of an NPS education. Since officers' salaries are the main drivers of graduate education costs, reduced TOS will reduce manpower costs. Reducing TOS will free up officers and allow the Navy and Marine Corps to use these officers in operational billets where they are desperately needed, especially in the SWO and Aviation communities. Additionally, DL will allow the Navy and Marine Corps to increase the number of officers with graduate degrees at lower cost than what they are paying now. However, DL may also have an adverse affect upon NPS's existing customer base.

Officers are the stakeholders who will pay the cost associated with DL. DL will require officers to dedicate more hours to career maintenance. Aggressively implementing DL will require officers to dedicate many off-duty hours to studying for DL to succeed. Additionally, the officer has an even shorter tour of duty at NPS and must move his/her family in a very quick fashion.

### **3. No Incentives are Provided to Officers to Embrace DL or Reduce Time Enrolled in an In-Resident Graduate Education Program**

A master's degree is the primary expected benefit that an officer receives upon entrance to a graduate education program. However, the current reward structure does not provide incentives for officers to readily accept DL or to reduce their time spent in a graduate education program. In fact, the current service commitment, which officers make upon entering a graduate education program, is regressive and may actually encourage students to prolong their time on station.

Furthermore, current promotion precepts, promotion rates, and perceptions of some officer communities discourage officers from pursuing resident graduate education.

## **D. RECOMMENDATIONS**

The following are specific recommendations to increase the number of officers with graduate degrees and NPS enrollment.

### **1. If DL is Implemented and TOS Subsequently Reduced, NPS Should Determine How Navy and Marine Corps Sponsors and Students Would Respond to this Policy.**

NPS must determine sponsors' preferences to take their benefits in terms of more officers out in the fleet or more officers with graduate education. With this data, NPS could use our model, based upon Little's Law, to predetermine expected percentage changes to inventory/enrollment and throughput/degrees awarded from NPS. This would allow NPS to properly allocate its scarce resources.

To determine officers' preferences for DL, NPS must expand our survey to the fleet and perspective students. An expansion of our survey will allow NPS to predetermine its customers' reaction(s) and allocate its resources accordingly.

### **2. The Navy, the Marine Corps, Sponsors and NPS Must Provide Incentives to Officers Who Embrace DL, Reduce TOS, and Obtain a Graduate Education**

First, NPS should use DL to complement its existing quality resident program. DL should not be a mandatory requirement for resident enrollment at NPS. NPS should

not use DL as a way to eliminate refresher and core courses, which are the foundation of NPS's current graduate education program. Furthermore, if NPS implements DL to complement its existing resident programs, NPS, the Navy, the Marine Corps, and program sponsors must ensure that safeguards are in place to prevent the inadvertent disqualification of those hardworking, dedicated officers who do not have time for, or access, to DL. Resident enrollment at NPS should be based upon an officer's past performance, technical expertise, and future service potential; not upon his/her ability to complete DL courses.

Second, officers, who do participate in DL and reduce their resident graduate education requirement, should be rewarded with a significantly reduced service commitment. The current service payback commitment is regressive and must be changed to reward students who reduce time spent in residence.

If reducing the service commitment is impracticable, the Navy could provide preferred follow-on orders at the time of admission to a shorter in-resident graduate program. Officers would know where they were going after graduate school and could move their families directly to their post-NPS duty station. This would allow officers, if desired, to avoid one additional permanent change of station (PCS) for their families. Additionally, this would allow officers to work on a project or thesis for the command for which they hold follow-on orders. The Navy and Marine Corps could save PCS dollars and sponsors would get a real-time output from the student while they attend NPS.

Finally, officer promotion precepts, promotion rates, and perceptions must be changed to reflect the importance of a graduate education. Promotion precepts must make mandatory promotion rates for graduate educated officers at least equivalent to or greater than the overall promotion rate for all officers being considered for promotion. This will send a signal throughout the Navy and Marine Corps that the CNO's vision of a highly educated officer corps is more than just an aspiration, but, in fact, reality. This will ensure that all officers and officer communities embrace graduate education and keep the officer corps ready to face the technically complex environment which the future officer/warrior will encounter.

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## APPENDIX A. SURVEY RESULTS

This appendix illustrates our survey results in table format.

<b>Question 1</b> Service?	Navy <b>51</b> 69.86%	USMC <b>19</b> 26.03%	Other <b>3</b> 4.11%	Total <b>73</b>
<b>Question 2</b> Rank?	O-1 <b>2</b> 2.86%	O-2 <b>0</b>	O-3 <b>44</b> 62.86%	O-4 <b>24</b> 34.29%
<b>Question 3</b> URL?	URL <b>24</b> 47.06%	non-URL <b>27</b> 52.94%		<b>51</b>
<b>Question 4</b> If URL, what kind?	Fixed Wing <b>0</b>	SEAL <b>1</b> 4.17%	Av. Maint. <b>4</b> 16.67%	Rotary Wing <b>0</b>
	SWO <b>16</b> 66.67%	NFO <b>1</b> 4.17%	Subs <b>2</b> 8.33%	Other <b>0</b>
<b>Question 5</b> If USMC, what kind?	Not a pilot <b>14</b> 73.68%	Helicopters <b>4</b> 21.05%	Fixed-wing <b>1</b> 5.26%	<b>19</b>
<b>Question 6</b> Still attend if DL Mandatory?	Yes <b>41</b> 56.16%	No <b>32</b> 43.84%		<b>73</b>
<b>Question 7</b> Had time for DL?	Yes <b>20</b> 27.40%	No <b>53</b> 72.60%		<b>73</b>
<b>Question 8</b> Take advantage of DL?	Yes, only if selected <b>26</b> 35.62%	Yes, even if not selected <b>11</b> 15.07%	No <b>36</b> 49.32%	<b>73</b>
<b>Question 9</b> DL for reduced payback?	Yes <b>25</b> 34.25%	No <b>48</b> 65.75%		<b>73</b>
<b>Question 10</b> Which has more value to you?	MBA <b>29</b> 40.28%	MS <b>25</b> 34.72%	Either <b>18</b> 25.00%	<b>72</b>
<b>Question 11</b> Value to your service?	MBA <b>14</b> 20.00%	MS <b>34</b> 48.57%	Either <b>22</b> 31.43%	<b>70</b>

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## APPENDIX B. MARINE CORPS PRECEPT

This appendix is paragraph 4 of the supplemental guide to the precept given to all promotion boards.

4. Career Patterns. The Marine Corps has not established an expected or preferred career pattern for officers of the Regular or Reserve Component. In your deliberations you should consider that assignments are made in the best interests of the Marine Corps. Officers rarely have direct influence over their assignments. As a result of assignment policies and practices, in the best interests of the Marine Corps some officers have developed skills and experience outside of their primary MOS and may have been ordered to serve multiple tours in that sub-specialty. When reviewing an officer's qualifications for the next higher grade, you should also consider that the Marine Corps benefits when the officer corps possesses a broad spectrum of experiences. Assignments to the operating forces, recruiting duty, equal opportunity duty, joint and external billets, international exchange tours, the special education program or the advanced degree program, the training community, and the supporting establishment, all contribute to the depth and breadth of experiences that are critical to the Marine Corps. In addition, in some instances, utilization policies or practices, such as those based on statutory restrictions on the assignment of women, may have had an effect on career opportunities of women. Likewise, in order to promote and administer equal opportunity policies, the Marine Corps has assigned some minority officers to certain billets (e.g., recruiting and equal opportunity), which may have affected career opportunities for these minority officers. All assignments are important to the Marine Corps, and successful performance of assigned duties is the key in measuring an officer's potential for promotion. In determining the qualification for promotion of any officer who has been affected by such utilization policies or practices, performance in duty assignments should be given the same weight as that given to duty equally well performed by officers who were not affected by such policies or practices.

Figure 21. Marine Corp Precept Supplement Paragraph 4

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